SQUAW CREEK

NARRATIVE REPORT

JANUARY - DECEMBER 1965

1965

NARRATIVE REPORT

SQUAW CREEK NATIONAL WILDLIFE REFUGE

PERMANENT PERSONNEL

Refuge Manager . . . . . Harold H. Burgess
Biological Technician . . . . . Albert J.Yocum
Maintenanceman . . . . . Henry Munkres
Dragline Operator . . . . . Alva W. Bomar
Operator General . . . . . William R. Hamilton

TEMPORARY PERSONNEL

Maintenanceman (Seasonal) . . . . . Walter J. Boyd
(1/1 to 2/27/65; 3/28 to 12/31/65)
Laborer (Student WAE. . . . . Lee P. Burgess Jr.
(1/1 to 4/2/65)
Laborer (WAE) . . . . . John W. Boyd Sr.
(9/28 to 10/29/65)
Biological Aid . . . . . Ronald Andrews
(9/1 to 11/26/65)
Laborer (Weekend Naturalist). . . . . Calvin Huffman
(10/15 to 11/13/65)

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
SQUAW CREEK NATIONAL WILDLIFE REFUGE
MOUND CITY, MISSOURI

C O N T E N T S

1965 Narrative Report

Squaw Creek National Wildlife Refuge

I. GENERAL

A. Weather Conditions

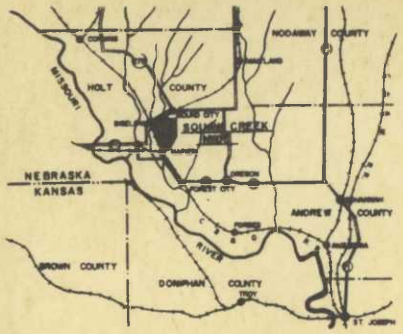
	Precipitation			Max.	Min.
	Month	Normal	Snowfall	Temp.	Temp.
January	3.52	1.20	2.3	62	-9
February	0.81	1.09	2.3	64	-5
March	3.06	2.33	8.2	68	6
April	2.15	3.15	____	90	28
May	2.01	4.39	____	91	43
June	8.30	5.93	____	91	55
July	9.62	3.22	____	94	56
August	4.76	4.21	____	95	52
September	10.53	3.44	____	91	34
October	0.16	2.18	____	91	27
November	0.65	1.68	T	78	10
December	1.81	1.36	2.0	70	16
Annual Totals	47.38	34.18	14.8 Extremes	95	-9

Information for the above weather summary was obtained from the U.S. Weather Bureau for their station at Rosecrans Memorial Airport, St. Joseph, Missouri - about 25 miles southeast of Squaw Creek National Wildlife Refuge.

Precipitation in 1965 was 13.20" above normal. Heavy snows fell during the first three months. April, May, October and November were relatively dry but excessive rains fell in June, July and September.

A mild winter was experienced in 1965 with the temperature down to -9°F only once. December, 1965 registered 16°F as its coldest temperature. The 1965 summer was also mild by Missouri standards. The temperature reached 95°F only once.

1965 Habitat Units



LOCATION MAP

SCALE

0 5 10 20 30

FIFTH PRINCIPAL MERIDIAN

LEGEND

REFUGE BOUNDARY

FENCE LINES

PRIMARY ROADS

SECONDARY ROADS

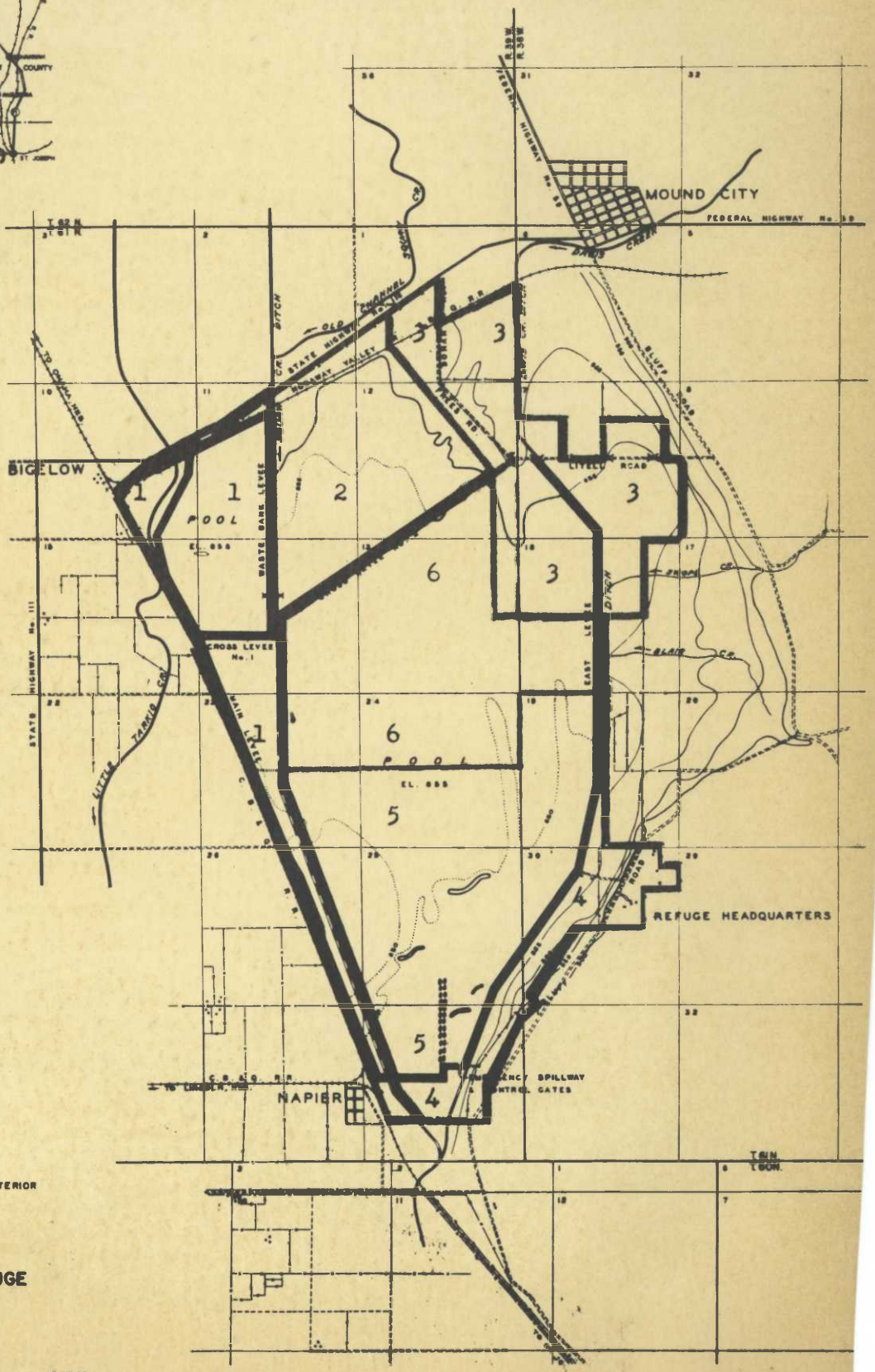
TRAILS

CANALS & DITCHES

Unit Boundaries 6/5

CONTOUR INTERVAL 5 & 20 FEET

DATUM IS MEAN SEA LEVEL



UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

GENERAL MAP

SQUAW CREEK

NATIONAL WILDLIFE REFUGE

HOLT COUNTY

MISSOURI

SCALE

0 1/2 1 2 MILES

80 CHAINS

WASHINGTON, D.C., DECEMBER 1936

430307

Table 2. Impoundment data South Pool, 1965

Month	Elevations Planned*	Average	Area-acres**	Capacity: Acre-feet***
January	851.00	850.10	920	250
February	851.00	850.30	1000	400
March	851.00	850.63	1250	800
April	851.00	850.84	1300	1000
May	850.50	850.38	1050	600
June	850.50	850.30	1000	400
July	850.00	852.15	2100	3200
August	850.00	851.83	1900	2600
September	851.50	851.36	1600	2000
October	851.00	851.16	1550	1500
November	851.00	850.69	1150	800
December	850.50	850.36	1050	500
Averages	850.73	850.84	1300	1000

* Revised to meet natural conditions.
** From Fig. 7 Master Plan Part II
*** From Fig. 8 Master Plan Part II

Table 3. Impoundment data Northwest Pool 1965

Month	Elevations Planned	Average	Area-acres**	Capacity: Acre-feet***
January	856.00	855.97	325	180
February	856.00	855.90	320	160
March	856.00	855.67	275	80
April	856.00	856.00	325	190
May	855.50	855.32	200	50
June	855.00	855.22	150	30
July	855.00	855.82	300	120
August	854.50	854.20	Dry	Dry
September	855.00	854.73	10	1
October	855.50	855.34	200	50
November	856.00	855.92	310	160
December	855.00	854.75	10	1
Averages	855.45	855.40	202	85

Table 4. Impoundment data West and Southwest Pools

Month	Elevations Planned*	Average	Area-acres.(Est.)	Capacity: Acre-feet
April	854.00	854.02	150	No Data
May	853.50	853.42	110	
June	853.00	853.00	100	
July	855.00	855.39	240	
August	854.50	854.54	200	
September	854.00	854.32	180	
October	854.00	854.44	200	
November	855.50	855.66	250	
December	854.00	853.92	150	
Averages	854.22	854.30	175	

* Revised as conditions developed. Decided to hold water up to reduce emergents after high waters of July.

B. Habitat Conditions

1. Water

Although waters sometimes exceeded needs and posed difficult management problems during 1965, adjustments were made that resulted in an excellent waterfowl use year. Tables 2,3 and 4 show impoundment data while table 5 shows waterfowl use. Sufficient water was not available until April to hold the Main Pool at planned level although the other pools were held at near optimum levels during the first quarter.

All pools were purposely held high during May and June to reduce emergent competition with desired food plants. Due to excessive rains and flood waters the pools could not be drawn down as planned in July to promote moist soil food plant growth.

Northwest Pool was drawn down by early August in barely sufficient time for an excellent crop of wild millet and late smartweed to mature.

West Pool was maintained at a relatively high level to further reduce cattail growth during the summer and autumn.

The Main Pool could not be drawn down during the summer due to the choking of Davis Creek with flood debris and silt. The 0.2 mile Davis Creek portion extending from Squaw Creek through the Bales Estate to the refuge and the "radial gate ditch" was cleaned out during September - October 1965.

The higher 60 acres of Agricultural Unit A-16 were diked off in early 1965 so that the remaining 100 acres could be managed for moist soil food plants. The low areas were wet most of the year and were flooded from September through November resulting in a very attractive duck unit.

The natural north central marsh and Bluff Pool marshes were flooded most of the summer and autumn and provided resting areas for waterfowl during windy weather.

All possible pools were drawn down in December in an attempt to move excessive numbers of mallards south.

Additional water management details have been supplied the Regional Office by our 1966 Water Program and 1965 Water Use Data Report.

2. Food and Cover Conditions

Refuge corn grain and wheat browse were completely used by waterfowl by late winter of 1965 except in Agricultural Unit #2. Although A-2 was subjected to considerable harassment by motorist

and other users on two border and one bisecting roads, geese continued to use the unit through May because it was the only refuge unit containing waste corn.

Late March melt waters made low areas especially attractive to ducks. Pintails even made considerable use of flooded seeds and grass roots on the fringe of Burn #6.

Excellent yields of corn were available to returning waterfowl in the autumn of 1965 but an early frost had reduced domestic millet and milo food production. A dense stand of mature wild millet and smartweed were available in the Northwest Pool and A-16 managed marsh while scattered crops of moist soil plant foods were produced in the West Pool and Silting Basins# 2, 3 and 4.

Much cover but little apparent waterfowl food was produced in Bluff Pool, the north central marsh and the "Cordgrass" Prairie. However a considerable quantity of smartweed and associated waterfowl foods were produced in those upper marshes of the Main Pool that extend into the prairie.

Table 5. Waterfowl use days by habitat unit and water areas 1965

Habitat Unit	Acres	Water Areas	Goose use days 1964	Goose use days 1965	Days use Per Acre	Duck use days 1964	Duck use days 1965	Days Use Per Acre
1	870	West Pools	3,319,282	5,684,322	6,534	8,173,581	6,590,165	7,575
2	880	No. Cent. Marsh	911,610	421,343	478	324,050	896,994	1,019
3	970	Bluff Pool:A-3	2,128,225	1,526,498	1,574	2,667,521	1,573,851	1,622
4	550	Davis Cr.:A-19	278,454	529,886	963	176,126	1,254,400	2,280
5	2,218	Main Pool	6,895,478	7,487,182	3,376	8,503,061	9,932,067	4,028
6	1,321	Long Sl:A-16	1,023,631	720,096	545	3,034,769	7,095,676	5,371
Total	6,809	Refuge	14,556,680	16,369,319	2,551*	22,979,048	27,343,153	4,016*

* Averages

From Table 5 it is quite apparent that Habitat Unit 1 was again the most attractive to waterfowl on an acre basis although duck use fell slightly. Increases in goose use can be attributed to additional browse plantings in the Northwest Pool spillway delta.

The large Habitat Unit 5 obtained the most waterfowl use and continued to rank high in waterfowl use per acre. Although little plant food was produced in the Main Pool, high waters made additional feeding sites available in the lower prairie area and provided loafing space for field-feeding waterfowl late in the season.

Waterfowl use increased for Habitat Unit 6. Duck use doubled due to the increased attractiveness of A-16 to ducks although goose use slipped apparently due to reduced acreages of corn and wheat browse.

Due to heavy spring use and the small area involved, Habitat Unit 4 ranks fourth on waterfowl use per acres basis. Comparatively

light use was made of Habitat Unit 4 during autumn and considerable corn remained at the close of the year.

Habitat Unit 3 dropped to fifth in waterfowl use per acre because high summer waters prevented optimum food production in A-3, A-5 and the Bluff Pool.

Habitat Unit 2 was again the least attractive to waterfowl. High summer waters prevented a natural drawdown of the north central marsh and swamp for food plant production and again discouraged the permittee in A-13 from doing a good job of producing corn.

At the end of 1965 considerable refuge corn remained standing in A-4, 5, 6, 7 and 8. This will be shredded as needed after the end of the Mississippi and Central Flyways' waterfowl hunting seasons. Apparently insufficient refuge browse will be available for the spring migrant geese.

Sufficient food and cover was available for resident wildlife in 1965.

II. WILDLIFE

A. Migratory Birds

A record of 43,712,472 waterfowl use days was set for 1965. Goose use rose to 16,369,319 and duck use soared to 27,343,153 days. Both figures are new high records. In addition the duck population reached 385,000 this fall, which is well beyond any previous peak duck populations.

Canada Geese

Up to 6,600 large and 70 small Canada geese were present in mid-January. These dwindled to 2,000 large and 10 small Canadas in early February and then increased to 9,000 large and 1,490 small Canadas on April 1.

A maximum of 11 large and 2 small Canadas vacationed on the refuge during the summer. The fall influx began with 2,200 large and 20 small Canada geese arriving the last week of September. This built up to peaks of 1,500 small Canada geese in November and 6,250 large Canada geese the last week of December.

Different race and population migrations and responses to management are briefed in Part V and will be further discussed in our 1965 goose study progress report.

White-fronted Geese

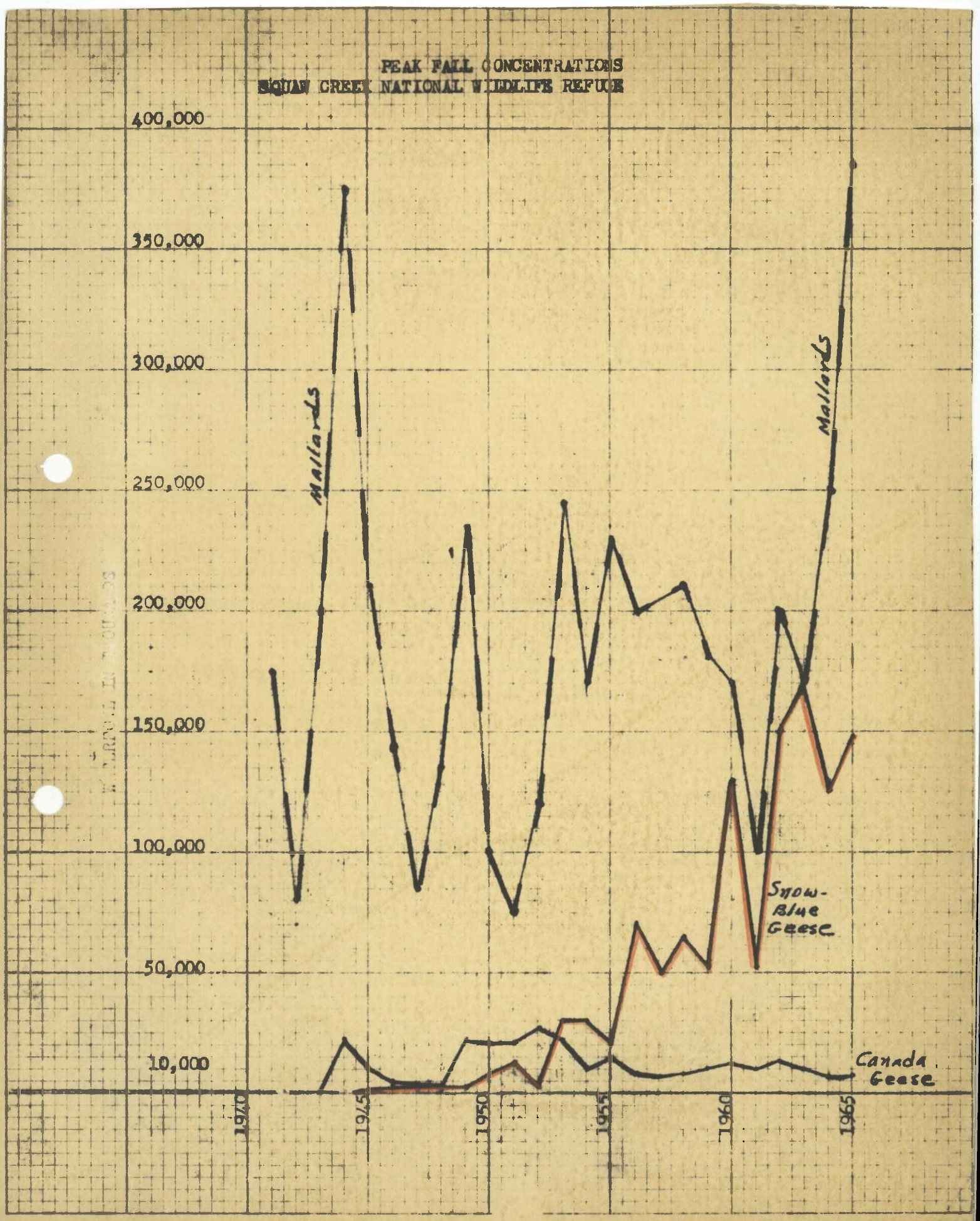
A part of the scattered eastern white-fronted goose population regularly use Squaw Creek in migration. The year started with 25 white-fronts on the refuge. This flock may have spent the winter in the Squaw Creek zone since they lingered on the refuge until the third week of January and then were sighted again on the refuge in mid February.

Spring buildup began in mid March and 2,010 white-fronts were present the next week. The fall migration began the last week of September. Thousands of white-fronts passed over the refuge on October 2,1965 when 560 chose to stop over. The last white-fronts departed from Squaw Creek in early November.

Snow - blue Geese

The year started with 7,500 snow and 2,500 blue geese on the refuge. This flock decreased to 500 snows and 1000 blues by February 4,1965 and left the refuge entirely during the second week of February.

The flock thereafter built up to 100,000 snows and 200,000 blues on the refuge by March 21st when 500,000 blue-snow geese were estimated in the Squaw Creek zone. These half million spring goose concentrations often occur in Northwest Missouri against a retreating


PEAK FALL CONCENTRATIONS
SQUAW CREEK NATIONAL WILDLIFE REFUGE
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
10,000
Mallards
Mallards
Snow-Blue Geese
Canada Geese
1970
1945
1950
1955
1960
1965

snow front. In 1965, a March blizzard and resulting snows actually forced the advancing waterfowl to retreat from Iowa where premature publicity had sightseers staring at barren snowscapes rather than at the blue-snow goose spectacular they had anticipated.

Two snow and two blue geese attempted to spend the summer on the refuge but they had disappeared by August.

Eight snows and 21 blue geese appeared the second week of September. The peak population of 116,400 snows and 29,100 blues occurred the last days of November but 45,000 snows and 15,000 blues were still present on December 31,1965.

Several years of observations here have indicated that the white phase of the lesser snow geese predominate in the wintering flock while the blue phase dominates the spring migration. The blue phase ratio would again be high in the early fall migrations but this ratio normally favors the white phase as the migration advances. These phenomena will be discussed further in Part V and in our forthcoming goose study report.

Some family flock, group and net banding observations were made during the fall of 1965 to assess productivity. Pre-season, in season and post season cannon netting and banding were accomplished. These studies are reported in Part V and will be described in our goose study progress report.

Brant and Ross' Geese

An immature Ross' goose was netted in October and two Brant were checked in hunter bags in November. A few Ross' geese have occasionally visited Squaw Creek during past autumns ane we have a 1964 sight record for a brant.

Ducks

Over 110,000 ducks attempted to winter on Squaw Creek Refuge in 1965 but, fortunately, effective snow cover reduced this flock to 6,000 mallards by late January. Another buildup began in mid February when 90,000 mallards, 440 black ducks, 1,000 pintails, and 100 common mergansers appeared but effective snows forced most of these ducks out but 3,000 mallards, 30 black ducks, 100 pintails, 10 green-winged teal, 10 wood ducks and 20 common mergansers persisted until the spring buildup began in early March. By mid March over 218,000 ducks were present including 126,000 pintails(!)and 95,500 mallards.

It was impractical to search all marshes but we estimated that 10 pairs of mallards, 2 pairs of pintails, 1 pair of greenwinged teal. 2 pairs of blue-winged teal and 7 pairs of wood ducks attempted to nest on the refuge or its vicinity. Two broods of mallards and one brood of wood duck were observed on the refuge. High

waters probably destroyed some ground nests. Wood duck broods probably preferred nearby small ponds and streams since such waters were available through the summer of 1965.

The fall influx began August 20th when 80 mallards, 90 pintails, 40 blue-winged teal and 10 wood ducks were counted. The duck population progressively increased until a 107,700 intermittent peak including 73,500 pintails was reached the first of October. The count dropped to 72,500 the next week after large numbers of pintail and blue-winged teal had departed. Increasing mallard numbers pushed the second peak to 226,000 ducks in late October but departing pintailllet these numbers down the following three weeks. During the third week of November, Missouri Waterfowl Biologist Richard Vaught recorded 320,000 mallards by aerial survey. He was quoted in numerous newspapers as stating that this was the most mallards that he had ever seen in many years of aerial surveying Squaw Creek Refuge. Actually our ground count for that week was 384,620 ducks but we did not argue against the aerial count. (Waterfowl inventory is further discussed in Part V.)

We began drawing down water areas to discourage excessive numbers of waterfowl wintering at Squaw Creek but over 100,000 ducks were still in the vicinity at the year's end.

Other waterbirds

Pied-billed, eared, western and horned grebes were all observed on Squaw Creek Refuge during 1965. White pelicans first appeared in early April and were thereafter present most of 1965 until mid November. Double-crested cormorants passed through in April and thereafter, except for one summer visitor, were not sighted again until mid September.

Great blue herons appeared March 31,1965 and were present until late November. Green herons appeared April 16, nested on the refuge, and were last sighted September 21,1965. An immature little blue heron was sighted May 2. Seven little blues were p present during August but none were sighted after September 3,1965. Common egrets were present in small numbers from April 4th to September 21,1965. Black-crowned-night heron appeared April 9, nested near Quarters-2 and were last sighted November 21,1965.

A few least bittern nested on the refuge as did a pair of American bittern. One American bittern was spending the winter with us as this report was written.

Five glossy ibis used the refuge September 18-23, 1965. An American flamingo strayed to the refuge on May 13,1965 and remained almost a month. It was wary and in all respects appeared to be a free-flying wild bird. It attracted about 1,000 sightseers as well as some excellent photographers.

A King Rail was sighted November 7th. A few Virginia rails were observed in late August. A sora appeared April 28th and a few were apparently present thereafter until early September. American coot first appeared the week of March 12,1965 and built to a peak of 8,200 during the spring migration. No coot were observed after mid June until 10 appeared in early September. The autumn peak was 6,500 coot with the last 10 observed in mid December. American coot spent 321,797 coot use days on the Refuge during 1965. There is no need to add coot use to waterfowl use to make a case for Squaw Creek National Wildlife Refuge.

Shorebirds

Eleven killdeer appeared March 16. At least one pair nested on the refuge. The last killdeers were sighted December 24,1965. Four semi-palmated plovers were sighted April 7 and the last three were sighted July 30,1965. A piping plover and a snowy plover were identified by visiting ornithologists on May 2,1965. Both species are considered rare visitors here.

Two American golden plovers were observed May 2 and 12 were observed May 20,1965. Four Black-bellied plovers were sighted May 2nd. Their numbers grew to 60 by May 20th with a straggler remaining until August 5th. The last 10 black-bellied plovers were recorded September 26,1965. Two ruddy turnstones were sighted May 9th and 8 were recorded May 20,1965.

Common snipe remain in the area most of the year. The first sighting was January 1st and the last recorded observation was November 20,1965. A whimbrel was present May 17-26,1965.

Spotted sandpipers were first sighted April 23. A few pairs nest on the refuge. The last record was two on September 2,1965. Solitary sandpipers were first noted May 2. Twenty were present during July and August. A pair of greater yellowlegs was present April 7 - 29, 1965. Five lesser yellowlegs were sighted April 5. They numbered 145 by April 29 and few stayed during the summer. Five pectoral sandpipers were first sighted April 1; 500 were present in mid May;but none were seen during the fall migration.

Five hundred white-rumped sandpipers used the refuge during May 1965. Thirty Bairds sandpipers and 500 least sandpipers were noted in May. Fifteen dunlin were observed in mid May 1965. Both long-billed and short-billed dowitchers were noted during the spring migration and 30 long-billed dowitchers were observed October 18,1965. Stilt sandpipers numbered 160 in mid May. Twenty semi-palmated sandpipers were noted April 18; 500 were recorded in mid-May but none were noted during the fall. A western sandpiper was identified on May 16. Six buff-breasted sandpipers were observed May 13.

Two marbled godwits were noted May 6. Twelve Hudsonian godwits were sighted April 18 and 90 were present in mid May, 1965. Four sanderlings were sighted May 9 and 20 were present in mid May. The three American avocets sighted April 25 remained until May 20th. Two avocets returned in early October. A Wilson's phalarope was sighted April 18 and 1,000 were present in mid May. Five northern phalaropes were observed May 16th.

Gulls and Terns

A few herring gulls passed through the refuge in early May. Ring-billed gulls were more commonly observed throughout the year. Over 2,000 Franklin's gulls massed on the refuge during their Spring migration but only a few were noted thereafter. The refuge had a peak of 20 Forster's terns during the summer. Two least terns spent the summer on the refuge. Four Caspian terns used the refuge during the summer and fall. About 500 black terns used the refuge during the summer and one lingered until October 18th.

Doves

A few mourning doves were winter residents. Their numbers increased to about 50 breeding pairs and to a peak of 400 summer resident and migrant doves by late August. This is considerably less than the 1400 reported on the refuge in August 1964.

B. Upland Game Birds

About 100 ring-necked pheasant and 50 Bob-whites wintered through on the refuge. Repeated rains and high waters apparently reduced early nesting. Some late broods of pheasants and quail were observed and possibly 200 pheasant and 60 quail were using the refuge by the end of the summer. Dispersal and mortality resulted in only about 100 ring-necks and 50 Bob-whites remaining by the end of 1965.

C. Big Game Animals

White-tailed deer were commonly observed on the refuge during 1965. No hunting is permitted on the refuge and relatively few deer were taken during the state bow season and forked buck gun hunting seasons in the vicinity. Post season observations and highway kills indicate that the refuge herd may have been as high as 100 deer on December 31,1965.

D. Fur Animals, Predators, Rodents and other Mammals

Form NR-4 for year ending April 30,1965 indicated 30 opossum, 200 raccoon, 30 mink, 20 striped skunk, 10 red fox, 10 coyote, 10 Franklin's ground squirrel, 400 fox squirrel, 50 pocket gophers, 4 beaver, 300 muskrat, and 200 cottontail were using the refuge.

On November 20,1965 we submitted the following estimate of furbearers and recommended removal:

Specie	Numbers	Removal	Refuge share	Permittee share
Opossum	30	Unlimited	None	100%
Beaver	20	"	"	100%
Muskrat	500	300	40%	60%
Coyote	20	Unlimited	None	100%
Red fox	10	Unlimited	"	100%
Raccoon	200	Unlimited	"	100%
Mink	50	40	50%	50%
Striped skunk	20	Unlimited	None	100%

Dr. Richard Meyers, Central Missouri State College, Warrensburg, Missouri this summer initiated a field excursion to study and collect mammals of Squaw Creek Refuge. We hope theirs will be an annual study camp which will help us better understand our complete environment as well as assist us in preparing a mammalian list for the refuge. Results of the study are discussed in Part V.

E. Hawks, Eagles, Owls, Crows and Vultures

A few turkey vultures were observed during the summer. A sharp-shinned hawk was noted March 20,1965. Two Cooper's hawks hunted in the refuge during the late winter and fall of 1965. Up to 21 red-tailed hawks used the refuge during the spring and early winter of 1965. Two pairs possibly nested on the refuge.

Two Harlan's hawks wintered on the refuge. A broad-winged hawk was noted April 18,1965. A Swainson's hawk was reported May 16. Six rough-legged hawks wintered on the refuge. Two golden eagles also wintered there.

Marsh hawks numbered 18 during the spring migration; 12 summered on the area and two were wintering on the refuge on December 31,1965. An osprey was observed April 22,1965.

A pair of peregrine falcons were observed during April,1965 and others occasionally pass through the area. A pigeon hawk spent the 1965 fall on the refuge. Sparrow hawks are year around residents. Twelve were the most observed.

A barn owl was sighted on March 20th. Two to four screech owls were permanent residents. Great horned owls were commonly heard and seen throughout the year. Four to 8 barred owls were permanent residents. A long-eared owl was caught in a muskrat trap on

January 11,1965. About 20 short-eared owls wintered on the refuge.

A saw-whet owl was observed near headquarters in December 1964 and again on January 1, 1966. Owl pellets under its favorite perches indicated its presence in 1965. This is a new addition to the Squaw Creek bird list.

About 100 crows wintered on the refuge and 500 visited during migrations in 1965. Only a few nest in this area.

Bald Eagles.

We are listing this species separately to do justice to this noble bird and to our staff for their numerous observations. Twelve adult and 28 immature bald eagles spent January 1965 on Squaw Creek Refuge. Numbers thereafter decreased as the mallards left the refuge during February and later in March when winter-killed fish became available.

The last spring bald eagle sighted was on March 31. An immature bald eagle appeared October 1, and 15 adults and 40 immatures were present at the end of the year.

One disabled bald eagle and two golden eagles were airshipped from Sand Lake National Wildlife Refuge "to catch the migration" during last winter. It took a week of our best diet of muskrat and bird carcasses to get the bald eagle and one golden in shape to fend for themselves. The other golden never could get itself airborne so arrangements were made for its care at the Muscatine, Iowa Zoo. All the eagles had been banded with regular size 8 bands at Sand Lake National Wildlife Refuge. Only one of these remained on these powerful birds by the time for release. We are now banding eagles with special lock-on eagle bands.

During November 1965 a disabled immature bald eagle was reported in a nearby hunting area. Carefule examination indicated no physical disabilities. It was a voracious feeder and soon regained its strength and was banded and released. In this case I suspect the young eagle was unable or too lazy to obtain sufficient food until it became too weak to fly.

F. Other Birds

The refuge bird list was redrafted to show 256 regular and 21 accidental bird visitors as well as some revisions of seasonal status. Birds added from observations made in 1965 are Brant, short-billed dowitcher, saw-whet owl, redstart, pine siskin, flamingo and lark bunting.

The Christmas Bird Count of Squaw Creek Refuge area was made on January 1,1966 with six area bird watchers and the manager as

compiler. Fifty five species and over a million birds were counted. Redwinged blackbirds were the most numerous and a saw-whet owl was the most unexpected sighting. A complete account of this survey will be published in the April 1966 Audubon Field Notes.

G. Fish

Most of the pools were infested with carp and bullheads during the 1965 high waters. Some channel catfish also enter the pools during the summer.

Samples taken during 1965 indicated that the large-mouthed bass and blue gill planted in the northwest borrow pits in September 1964 might grow large enough for sport fishing in 1966.

H. Reptiles and Amphibians

Snapping turtles continue to be too large and numerous for a good waterfowl refuge. We have many observations of turtles attacking ducks. Painted turtles are commonly sighted while leather back turtles are ocassionally seen. Comparatively few massassauga rattlesnakes were observed in 1965. Their presence keeps sightseers on the road and our employees alert. Garter, ring-necked, blue racer, black, brown and water snakes were commonly observed.

Several members of the Central Missouri State College were specially interested in amphibians and collected: Rocky Mountain Toads (Bufo w woodhousi), Great plain Toads (Bufo cognarus) and a Narrow Mouthed Toad (Gastrophrynec olivacea) for our files while observing such common amphibians as spring peepers, tree frogs, leopard frogs and bullfrogs.

I. Disease

In early October, Biological Technician Yocum investigated a report of snow geese flying into a high line near the refuge. About 23 of these geese were found near the News-Independant Office in Mound City where a lineman had carted them for a photograph. These were turned over to the County Welfare office for disposition. These types of disability and mortality are too often not reported to conservation agencies and are too often overlooked.

There was less lead poisoning in Squaw Creek waterfowl in 1965 than in 1964. Reduced duck-hunting in neighboring duck ponds in 1965 probably resulted in less unsilted spent lead being available. Our campaign to drain private hunting ponds at the end of the duck hunting season may also have reduced lead poisoning. (See Squaw Creek Digest News Release of November 30, 1965 appendixed)

Crippling lssses of wounded birds falling into or returning to the refuge were high. We estimate 267 Canada geese, 2,300 lesser snow geese and 1,750 ducks were lost to the hunter in that manner. Most of these birds are eaten by such predaceous animals as raccoons, bald eagles, coyotes, foxes, crows and gulls, but some recover to fly again. A reduction in this waste would be significant to both the hunter and to our future brood stock.

Fowl cholera has not reappeared on the refuge since March 1964. Care was taken to prevent the previous infection sites from becoming attractive to waterfowl during the 1964-65,fall and winter. Excessive numbers of waterfowl have been discouraged from wintering on the refuge during 1965 by shutting off the pumps and drawing down the water areas. We were concerned with possible disease resistant breakdowns under stress conditions.

The Refuge Manager gave a paper "Fowl Cholera in Northwest Missouri" at the Midwest Wildlife Conference, Lansing,Michigan on December 7, 1965 and has assisted and is assisting Missouri Biologist Richard Vaught and Dr.H.C. McDougal, D.V.M. Professor University of Missouri in preparing a manuscript on the same subject for the Journal of Wildlife Management.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development and Maintenance

The south levee of enlarged Silting Basin #3 was completed with overflow culvert and spillway in 1965. This proved to be a good waterfowl rest area with greater waterfowl potentials after food plants develop following silting.

Sixty five man and heavy equipment days were spent maintaining the Davis Creek spillway and diversion ditch. The spillway was finally rocked and raised two feet to 858 feet to reduce maintenance. Another 60 man days were spent brushing, burning, spraying, and otherwise maintaining our extensive drainage and flooding systems.

A vital fall accomplishment was the cleaning of Davis Creek from Squaw Creek through the Bales estate to A-2. This made it possible to draw down the Main Pool and should give us quicker flood relief until that section of creek silts again.

About a mile of East Davis Creek spoils were graded into an agricultural levee and seeded to wheat. The agricultural levees were maintained around A-19. Considerable willows in Silt Basin #2 were rotary mowed or disced. Although this basin remained too wet for wheat planting, it was heavily used by waterfowl after partial flooding during autumn.

About a mile of East Squaw Creek spoils was graded into an agricultural levee and work road. About 11 man days were spent grading the gumbo spoils of old - abandoned Davis Creek and building a cannon netting site. Much more needs to be done to extend this potentially excellent goose area.

About 27 man days were spent on flood control during June and July involving many overtime hours for wage hour employees.

About 76 man - equipment days were spent on refuge road maintenance and still the Secretary's Office received a letter complaining about our "terrible roads". An expensive road surfacing job is long overdue.

The higher 60 acres of A-16 were leveed and ditched with a 3' flap gate outlet to grow corn, while the remaining acres were returned to a moist soil food plant production area with an overflow pipe into Silt Basin #2 and a natural spillway into the cordgrass prairie. The reception by pintails and mallards was excellent.

A water level gauge was installed at the outlet of West and Southwest Pools. Gauge readings of the three measurable pools were periodically made during the year.

In addition to 46 man days of building maintenance, three building roofs were shingled by contract, six buildings were painted and several rooms in Quarters 1 and 2 were painted. The headquarters' yards were mowed almost weekly during the long Missouri spring and summer and several days were spent trimming trees in that area.

We were able to put only 8 man days on boundary fences and signs in 1965. Rehabilitation of these facilities is badly needed.

Wildlife surveys were made often and reported weekly. About 54 man days were spent banding waterfowl during January and February 1965 and 80 man days were spent on similar duty during the 1965 fall. Over 150 man days were spent operating check stations during the Canada goose hunting season. Twenty man days were spent recording and compiling raw band, check station, and processor data during 1965 (See Part V for details.)

In addition to our staff we wish to acknowledge the help of U.S.G.M.Agent Jay Gore (in training), Biologist Lou Swenson A.A.O. Office, Minot, S.D., Assistant Refuge Manager Jim Hansen, Mingo N.W.R., Puxico, Mo., Assistant Refuge Manager Marvin Duncan, Desoto N.W.R., Missouri Valley, Iowa, and State Biology Aids Jerry Gordon, Mrs.Martha Andrews, and Don Poage with the waterfowl banding, checking, and recording activities.

About 50 man days were spent on preventative maintenance and safety checks and repairs to keep our fleet of eight vehicles, three farm tractors, three crawler tractors, two draglines, and various other equipment moving safely.

The 1946 Ford Courier was upgraded and replaced by a 1961 Chevrolet Pickup from Defense surplus. A crawler Lorain backhoe, a portable welder, and Adams road grader and a number of treated poles were also obtained from surplus.

B. Planting

4. Cultivated Crops

The poor 1964 corn crop (except for A-2) was fed out during the waterfowl hunting season. A-2 was subjected to harassment from highway and workroad travel during the hunting season so its corn crop was left standing to meet emergency snow-feeding conditions. Geese fed in this corn up into May 1965, yet some of its ear corn had to be picked from the ground by hand to prevent excessive volunteer corn growth - a paradox from a poor corn year.

Winter browse consisting of 355 acres of wheat, 5 acres of rye, 51 acres of Reed canary grass, 2 acres of redtop, and 5 acres of brome grass remained in good grazing condition during the spring migration .

Three miles (12 acres) of Squaw Creek agricultural levee and 0.5 mile of Squaw Creek levee (4 acres) were seeded to fescue grass. Brome grass was also seeded on several narrow dikes and road shoulders to provide ground cover.

Forty five man days were spent during the spring of 1965 planting refuge corn and supervising corn (and soybean) planting by Cooperative farmers.

The refuge planted 95 acres of Cargill 340 aimed at 19,600 stalks per acre and fertilized with 100 pounds of 8-32-62 starter and 92 pounds of anhydrous ammonia per acre. We planted about 30 acres of Cargill Sho me 120 and 5 acres of Dekalb 441A aimed at 16,000 stalks per acre using no fertilizer.

The Cargill 340 corn was treated with two pounds of atrazine(a.i.) per acre. The pre-emergent treated area had no further cultivation and no weed growth. Atrazine also was useful in controlling weeds in grassy corn treated in the seedling stage.

Low lying, untreated grassy corn was difficult to cultivate during the 1965 wet season, but misfortune here was turned into good fortune by progressively flooding the resulting moist soil food plants and stunted corn as the waterfowl migration advanced.

Refuge-planted corn averaged 87 bushels per acre and yielded 11,354 bushels of corn - all for wildlife.

Cooperative farmers planted 661 acres of corn which averaged 52.4 bushels an acre and ranged from 20 to 147 bushels per acre. Most of this corn was grown under a basic agreement whereby the farmer took 60% of the crop and left the refuge's 40% standing. However, in several cases he could take a third of his area share in soybeans. These cooperators' efforts left 14,921 bushels of corn standing on the refuge, in addition to normal harvest wastes, for wildlife food.

Cooperative farmers also planted 133.5 acres of soybeans and reaped 4,430 bushels of soybeans from the refuge.

We experienced difficulty planting 36 acres Cargill GS-61 grain sorghum in wet ground. The seedlings suffered through a wet seed bed, drouth, flooding, and an early killing frost to produce only 20 bushels per acre or 720 bushels of grain - mostly for blackbirds. The grain sorghum did best on the driest sites where it matured more quickly. We can see little place for grain sorghum in our future except as emergency food during drouth or late planting years.

Wet weather and grounds in July only permitted the harvesting of 12 acres and 360 bushels of refuge wheat. Cooperative farmers were able to harvest 800 bushels from 22 acres of wheat. A pick-up load of refuge brome grass seed was also harvested in July.

Wet weather and grounds kept us from drilling 1700 pounds of domestic millet seed until late July and early August. Most of the German millet failed to mature due to the premature Sept. September 20,1965 killing frost but some hand-broadcasted Japanese millet did well in A-19.

Twenty five tons of alfalfa were harvested as part of the Cooperative farmer's share in operating agricultural Unit #2. Permittees harvested and purchased 12.5 tons of reed canary grass from A-5-6 for $25 and 8 tons of mixed Alsike clover-grass hay off the airplane landing strip in A-5-3 for $24.00.

Wet July weather delayed early August wheat browse plantings and August drouths prevented germination. Wet September weather interfered with September browse and seed wheat plantings - mostly made in the mud. Because wheat browse was inadequate, plantings were continued as parcels of land became ready even into December, but October drouth prevented much improvement. The refuge ended the planting season with 290 acres of wheat planted while the cooperative farmers planted 34 acres.

Seven bushels of drouth-resistant Elbon rye were obtained from the Holla Bend National Wildlife Refuge, Russelville, Arkansas and planted during October. This variety responded well to the dry weather, stayed much greener than our best wheat and, although planted in a normally non-use area, proved attractive to geese. It will be watched carefully for winter-killing and yields.

C. Collections and Receipts

About 250 bushels of corn were hauled in January from Desoto National Wildlife Refuge, Missouri Valley, Iowa for waterfowl netting operations. Seven bushels of Elbon Rye were received from the Holla Bend National Wildlife Refuge and 200 bushels of wheat were received from Desoto National Wildlife Refuge for fall seeding.

D. Control of Vegetation

About 20 man days were spent clearing brush off the Northeast Pool's island and delta. About 20 acres were cleared for wheat planting with most of the debris bulldozed,into burning piles. Felled brush and trees were left scattered over an additional 40 acresburn on the delta and on the island to permit a growth of annual vegetation and then a hot burn to consume all of the debris.

About 5o acres of levees and ditch banks were sprayed with 2-4D

and 2-4-5 T to control willow, cottonwood, and other undersized vegetation. The refuge sprayed 93 acres and cooperative farmers sprayed 475 acres of corn to control foxtail grass (Setaria) and other weeds. Pre-emergent treatments were 100% successful while post-emergent spraying was about 80% successful in controlling foxtail. About 126 acres of corn were sprayed with 2-4D for the control of broadleafed weeds.

About 116 acres of soybeans were treated with Amiben to control weeds successfully, but Trefluralin was not successful when it was used to also control shatter cane in 12 acres of soybeans.

Two acres of Southwest Bell Telephone right-of-way infested with Johnson grass (Sorghum halepense) was treated August 1 and 12,1965 with 6 pounds of Dalpon(a.i.) with 12 gallons of water. The control was applied too late in the season for good initial control and too early for good autumn control. - Perhaps we held our own. Johnson grass spots were also sprayed or cut out along the Squaw Creek Road.

E. Planned Burning

A wet September prevented planned burning until October 11,1965 when Burn Unit # 7 was touched off. It burned well until it approached wet areas and then died with about 400 acres burned. An unsuccessful attempt was made to complete this burn on November 4, but it was November 22nd before the remaining 200 acres could be burned. Water in the hidden ponds and depressions prevented Burn Unit 9 from burning. The unit did not green up to attract geese as planned due to the late burn dates and premature killing frosts, but ducks did use the burn some after the unit was flooded.

A centrally located 60 acres of Silt Basin # 1 (Burn Unit # 1) was burned December 20, 1965 to prepare the area for a 1966 wild hay crop and a possible wheat browse planting. Steam from the wet basin kept the fire from burning to its south levee.

F. Fires

Fire escaped from a C.B. & Q. R.R. burning project into the refuge on September 2, 1965 but was quickly put out by a 20 member railroad crew and our bulldozer.

G. Insecticide

Following extensive flooding in July, Mr.Garth Sharp, Chairman of the Holt County Disaster Committee, and representatives of U.S. Public Health Service and an aerial spraying service con-

tacted us for permission to spray a portion of the refuge to control potential disease-carrying flies and mosquitos. Approval was quickly obtained from our regional office to permit aerial spraying of about 2,000 acres of shallow waters and land with 0.1 (a.i.) pound of Malathion. No effect was noted on insects or other wildlife. In fact the aerial service was called back to respray Mound City and Craig because, as one lady put it, "That first spraying only made the mosquitos mad."

IV. RESOURCE MANAGEMENT

A. Grazing

Experimental grazing as a goose browse management has been approved but not initiated.

B. Haying

No wild hay was harvested. Other haying is listed in Part III.

C. Fur Harvest

John Boyd, Fortescue, Missouri, continued trapping and , during January 1965, harvested 2 muskrat, 2 mink, 22 raccoon, 3 opossum and 3 striped skunk.

The general furbearer trapping season opened again on December 1,1965 but the refuge did not permit trapping until after the close of the duck hunting season on Decemner 7th. During December 1965, John Boyd harvested 66 muskrat, 4 mink, 2 beaver, 11 opossum, and 23 raccoon when Calvin Huffman and Gale Hagee, Mound City, trapped 6 muskrat and 1 raccoon.

The January muskrats were sold for $1.30 each while the mink averaged $8.10 , The December muskrats averaged $1.80 while the mink averaged $11.00.

V. FIELD INVESTIGATIONS AND APPLIED RESEARCH

A. Progress Reports

1. Vegetation Surveys

No vegetation surveys were made in 1964 nor 1965.

2. Wood Duck Studies

Wood duck populations were low. No broods were observed in the Annual Missouri Waterfowl Nesting Study, June 15 - 30,1965, when seven lone drake wood ducks were noted on the refuge. Later observations indicated that one clutch of wood ducks was brooded on the refuge. No wood duck were banded in 1965. So few wood duck were present that counts at previous established roosts were found impractical.

3. Teal Studies

Banding sites were pre-baited and trapped during August by U.S. Game Management Agent in training, Jay Gore and operated by Biological Aid Ron Andrews until Teal Hunting Season opened September 18,1965 without trapping success. Apparently teal feeding conditions were too attractive elsewhere and trapping was too early.

Hunter performance observations by our staff, U.S. Game Management Agent Robert Wheeler and Missouri Department of Conservation Agents indicated a lot of sport was obtained by a few teal hunters with comparatively few violations in the Squaw Creek area.

Feather pickers handled 440 teals within the Squaw Creek check area. If 3.2 teals were harvested for every teal processed (as was true of all ducks in 1964) then 1,408 teals were bagged. The rank vegetative cover and extensive flooded areas made recovery difficult. The estimated crippling loss was 20% of the total kill and the estimated total kill in the immediate vicinity of the refuge was 1,760 teals.

4. Cooperative Goose Studies

The cooperative study outline and agreement with the Missouri Department of Conservation for the study of wild geese of Squaw Creek National Wildlife Refuge with emphasis on management implications, drafted in 1964, were approved in June 1965.

The 1964 Progress Report on Goose Management at Squaw Creek National Wildlife Refuge was completed in September 1965. Several conferences between Bureau and Missouri personnel

were held during 1965 to formulate management plans. Ground surveys of waterfowl were made almost every week by the refuge staff, while Missouri personnel made several aerial counts during the winter and almost every week during the fall migration and hunting seasons. Aerial counts were usually supplemented with refuge ground counts to determine composition of the various waterfowl populations. Observations during the 1965 fall indicated that different responses by different races of Canada geese might be resulting in subnormal aerial counts.

An alphabetized list of about 2000 waterfowl hunters and addresses were compiled from the 1964 check station and area processors' records. Due to budgetary limitations, the Migratory Bird Population Station could not expand its goose tail survey with this list as we had hoped, but we did make local use of the list for cross-checking waterfowl harvest reports in 1965.

Cannon-netting in January - February 1965 resulted in our banding 389 large and two small Canada geese. These are being compiled with the 1964 Post-season netting samples for the 1965 Annual Progress Report.

The following geese were taken by cannon net prior to the 1965 goose hunting season:

Table 7 Composition of 1965 pre-season banded geese

Type	Adult Male	Adult Female	Immature Male	Immature Female	Unknown Unknown	Total	I/Ad.
Small Canadas	2	2	3	1		8	1.0
Snow geese	23	24	33	28	2	110	1.3
Blue geese	16	10	35	17	-	78	2.0
Ross' geese	-	-	1	-	-	1	-
Total	41	36	72	46	2	197	1.5

Dr. F.G. Cooch, Canadian Wildlife Service, had asked us to band a sample of lesser snow geese 30 days after our pre-season sample for differential population-migration studies. We banded 345 white-phased and 143 blue-phased geese from November 20 to December 22, 1965 as follows:

Table 8 Lesser snow geese banding 1965 hunting season

Type	Adult Male	Adult Female	Immature Male	Immature Female	Total	I/Ad.
White phase	72	67	104	102	345	1.5
Blue phase	31	30	38	44	143	1.3
Total	103	97	142	146	488	1.4

There were 1.4 white to a blue-phased goose in the pre-season bandings and 2.4 white to a blue-phased goose for the hunting season banded lesser snow geese.

Over harvesting of Squaw Creek zone Canada geese led to a 30 day hunting season and a one Canada goose bag limit in 1964. Costs and dangers associated with an extensive highway check station system led to compulsory registration of all Canadas shot in the Squaw Creek zone in 1965.

A preliminary report of the 1965 Canada goose harvest in the Squaw Creek zone follows:

"In calculating the total kill of Canada geese through the use of compulsory check station data in the Squaw Creek Zone, it is necessary to assume that some Canada geese harvested in that zone were not registered and that other Canadas were mortally wounded but escaped to the refuge and otherwise were not taken by the hunter.

"Registration

"Based on highway checks, hunters' apparent lack of knowledge of the new compulsory registration law and indifference, we believe that only about 75% of the harvest were registered the first week. Compliance improved as the hunters became better acquainted with the regulation and that we intended to enforce compliance. We would assess the registration as follows; first week 75%; second week 80%; third week 85%, and last nine days 90% of the total harvest. This is in line with the 18.7% non-reported harvested estimated for Horicon, Wisconsin Area in 1960 (Green, Nelson, and Lemke 1963). The Squaw Creek harvest is then calculated ; % compliance is to registered harvest as 100% is to total harvest.

Period	% Compliance	Registered Harvest	Total Harvest
10/20-26/65	75%	230	307
10/27-11/2	80%	182	227
11/3-9	85%	187	220
11/10-18	90%	282	313
Totals Harvest	(82.5% Ave.)	881	1,067

"Crippling Loss

"Because Squaw Creek Zone Canada geese are mostly shot near the refuge boundary, an excessive number of mortally wounded Canadas escape to the refuge or otherwise escape the hunter. Under similar circumstances at Horseshoe Lake in Illinois, Hanson and Smith (1950) estimated an additional minimum 25% of the take (20% of the kill) were lost as cripples. Green, Nelson, and Lemke(1963) calculated that 22.5% of the total kill were crippling loss in the

state-managed Horicon National Wildlife Refuge hunting area and zone 1 (the adjacent private hunting areas), while the crippling loss figures out at 19.9% of the entire Horicon zone kill. It seemed applicable, therefore, to use a 25% of harvest or 20% of total kill factor for calculating Squaw Creek's 1964 and 1965 crippling loss. Thus 25% of the 1,067 harvest is 267 crippling loss for a total Canada goose kill of 1,334 Canada geese"

The 1964 waterfowl harvest information obtained by our highway check station;processing plant formula was used to extend the check area processors' registered data for the regular waterfowl hunting season in 1965 to estimate the waterfowl kill;

Table 10 1965 Processed Waterfowl and Total Kill

Item	snow-blue	white-fronted	Canada geese	Mallard	Total ducks
Processed	1,129	1	317	1,597	2,189
Bag/processed	8.18	11	5.2	3.2	3.2
Est. Bag	9,235	11	1,648	5,110	7,005
Est.20%Crippled	2,309	3	412	1,278	1,751
Total	11,544	14	2,058	6,388	8,756

It is noted that 726 more Canada geese were estimated killed in Table 10 than by the use of compulsory registration figures. Proportionally more geese were processed during the 1965 Canada goose hunting season than during the 1964 Canada goose season because of greater danger of spoilage. The 1965 hunting season was advanced 10 days and the temperatures were higher. We are, therefore,using registration Canada goose harvest figures as the basis for our 1965 Canada goose kill estimate. However, such processing differences did not occur with other waterfowl because the regular goose hunting season extended 70 days into colder weather and the 1965 regular duck hunting season was timed similarly to 1964.

During the 1965 hunting season, 284 Canada goose heads, tails, and wing specimens were collected from local processing plants for classification by Dr.Harold Hanson, Illinois Natural History Survey and author of The Giant Canada Goose .

Table 11 1965 Composition of Canada Geese from Processors

Type	Western Prairie	Giant	Eastern Prairie	Sand Lake Hutchins	Baffin Hutchins	Un-known	Total
Adult	79	5	3	7	36	1	131
Immature	109	5	8	7	23	1	153
Totals	188	10	11	14	59	2	284

Check station operators aged, sexed, and classed 834 geese as large or small Canada geese;

Table 12 Check Station 1965 Canada Goose Classification

Type	Adult Male	Adult Female	Immature Male	Immature Female	Total	I:ad
Large	151	146	166	148	611	1.06
Small	61	58	50	54	223	0.87
Total	212	204	216	202	834	1.00

Hunting season banding samples consisted of 56 large and 81 small Canada geese, aged and sexed as follows:

Table 13 1965 Canada Goose Hunting Season Bandings

Type	Adult Male	Adult Female	Immature Male	Immature Female	Unknown Unknown	Total	I:ad
Large	11	13	13	18	1	56	1.3
Small	19	24	21	17	0	81	0.8
Total	30	37	34	35	1	137	1.0

Forty seven large Canada geese trapped during the hunting season were classed as 36 western prairie, 6 giant and 5 eastern prairie Canada geese. Eighty one small Canadas trapped during the hunting season were classed as 20 "Sand Lake type Hutchins" and 61 "Baffin Island type Hutchins" Canada geese. Samples of blood and primary feathers were collected from these geese by Dr.Hanson for further study of trace elements, diseases, and other indications of nesting range, environment for cross checking morphological characteristics.

Between November 19 and December 31, 1965 we banded 138 large and 128 small Canada geese; aged and sexed as follows:

Table 14 1965 Post-season Canada Goose Banding

Type	Adult Male	Adult Female	Immature Male	Immature Female	Total	I:ad
Large	40	44	31	23	138	0.64
Small	47	33	21	27	128	0.60
Total	87	77	52	50	266	0.62

5. Cooperative Mammal Study

Dr. Richard F.Meyers, Associate Professor of Zoology, Central Missouri State College Warrensburg, Missouri directed a zoological excursion of Squaw Creek National Wildlife Refuge on July 15 - 18, 1965 primarily to survey the mammals using the area.

The following mammals were collected: eastern mole (Scalopus aquaticus), red bat (Lasiurus borealis), fox squirrel (Sciurus niger), white-footed mouse (Peromyscus leucopus), deer mouse (Peromyscus maniculatus), western harvest mouse (Reithrodontomys megalotis), meadow jumping mouse (Zapus hudsonius), house mouse

(Mus musculus), coyote (Canis latrans) and raccoon (Procyon lotor).

This class made up eight small mammal study skins for the refuge reference collection.

In addition, the following mammals were observed and definitely identified by this study: opossum (Didelphis marsupialis), Eastern cottontail (Sylvilagus floridanus), Franklin ground squirrel (Citellus franklinii), muskrat (Ondatra zibethicus), mink (mustela vison), striped skunk (mephitis mephitis) ,and white-tailed deer (Odocoileus virginianus).

6. Cooperative small white goose study

David Trauger and Dr.Paul Vohs, Iowa State University, Ames, Iowa have been assisted by our staff during the past three years in collecting information on Ross' and "Ross-snow hybrid" geese occurring in the Mississippi and Central Flyways. To date about 50 records of Ross' goose occurrences in these flyways have been documented.

Blood tests have proved that the so called Ross-snow hybrid can be definitely separated from either Ross' or snow goose blood types. Observations of breeding-production activities are needed in the arctic nesting areas or with captive birds to determine whether the small white goose is, in fact, a separate unity.

7. Waterfowl Inventory Study.

The adequacy and accuracy of Squaw Creek Refuge's waterfowl surveys were scrutinized in 1965 and these proved inadequate for specialized programs.

Aerial counts of Canada geese were often 20 to 30% below ground counts. These differences are critical when the harvest is regulated toward a 15-20% kill of the peak population. Difficulties stem from the relatively low numbers of Canada geese (6,000) and high populations of snow-blue geese (150,000) and high populations of mallards (350,000) as well as quite different responses exhibited by the several races of Canada geese toward aerial surveillance.

Aerial counts of snow-blue geese appeared adequate when corrected for blue geese according to blue:snow ratio obtained by coordinated ground counts. Aerial counts are essential to cover the extensive foraying areas used by these geese.

Aerial counts of ducks become adequate when ice forces them out of the marshes but we have no adequate method for counting these marsh-loving creatures in early fall.

Further study will be carried on in 1966 when a wildlife inventory plan will be formulated. Special studies will be directed toward improving both aerial and ground surveys of Canada geese.

VI Public Relations

A. Recreation Use

The public used Squaw Creek National Wildlife Refuge about 16,180 times in 1965. This converted to about 4,518 visitors days according to the "Uniform Recreation Use and Reporting System" which features the 12 hour visitor-day. The 1965 Public Use - Conversion Factors and Form NR-6 "Public Relations" were submitted in mid December.

B. Refuge Visitors

A list of the more important (to the refuge program) visitors has been sorted out of our visitor register. Visits by such regulars as U.S. Game Management Agent John A. Hague; Missouri Department of Conservation Agents Jan Clifton and Glen McCloud and Agent Supervisor Paul Johnson; birdwatchers Floyd Lawhon, Simon Rositzky, Robert Brown, John Hamilton and David Easterla and Mammalogist Richard Meyers may be listed only once to save space and repetition.

1/13 Lloyd Hult, U.S. Public Health Service, Kansas City, Mo.
1/14 O. Fred Veach, Mo. Dept. of Cons., Meadville, Mo.
1/21 Bob Shepard, U.S.C.G.S., Bethany, Mo. - sub-surface water
1/21 Anthony Homyk, U.S.C.G.S., Rolla, Mo. - Sub-surface water
1/27 Eldon Heflin, Forester, M.D.C. St. Joseph, Mo.
1/27 John A. Hague, U.S.G.M.A., St. Joseph, Mo.
1/28 Glen McCloud & Jan Clifton, M.D.C. Agents.
2/10 Dick Vaught, M.D.C., Columbia, Mo. - Goose Report
2/19 Tom Davis, M.D.C., Cameron, Mo.
2/28 Kathy & Dave Trauger, I.S.U., Ames, Ia.
3/15 Hollis D. Crawford, M.D.C. Field Service Agent, Cameron, Mo.
3/19 Urban C. Nelson, BSFW, Minneapolis, Minn. - Goose Meeting
3/19 Robert Marcotte, Omaha, Nebr. - Goose Meeting
3/19 Milt Reeves, BSFW, Minneapolis, Minn. - Goose Meeting
3/19 C.E. (Ted) Shanks, M.D.C., Jefferson City, Mo. - Goose Meeting
3/19 George K. Brakhage, M.D.C., Trimble, Mo. - Goose Meeting
3/19 Robert Dunkeson, M.D.C., Jefferson City, Mo. - Goose Meeting
3/19 Wayne E. Sanders, U.S.G.M.A., Jefferson City, Mo. - Goose Meeting
3/21 Wesley C. Newcome, U.S.G.M.A., DesMoines, Iowa
3/24 A. Raymond Frandsen, Nebr. Cons. Comm., Falls City, Nebr.
3/24 Max Showater, Nebr. Cons. Comm., Nebraska City, Nebr.
3/24 Leroy Amis, Nebr. Cons. Comm., Lincoln, Nebr.
3/24 Anthony Homyk, Dist. Engr., Water Resources Div., Rolla, Mo.
3-26 Dave Trauger, I.S.U., Ames, Iowa
3/26 Leigh Fredrickson, I.S.U., Ames, Ia.
3/26 Dr. H.H. Knight, I.S.U., Ames Iowa
3/31 Dick Vaught, M.D.C., Columbia, Mo.
4/4 C.L. Kucera, Botony Dept., U. of Mo., Columbia, Mo. - Field trip
4/4 Richard F. Meyers, Biology Dept., Central State College, Warrensburg, Mo.
4/4 Dave Easterla, Zoology Dept., K.C. Jr. College, Kansas City, Kans.

4/6 John A. Hague, USGMA, St. Joseph
4/6 Wayne E. Sanders, USGMA, Jefferson City, Mo.
4/6 Paul Johnson, MDC, St. Joseph, Mo.
4/6 Kenney Armstrong, MDC, Maryville, Mo.
4/6 Jan Clifton, MDC, Mound City, Mo.
4/6 Glen McCloud, MDC, Rock Port, Mo.
4/13 Lee P. Burgess, Columbia, Mo. (U. of Mo.)
4/19 Roy & Mrs. Coy & dtr., St. Joseph Museum - Collecting
4/20 Bob Shepard, USCGS, Bethany, Mo.
5/11 & 12 Fred Veach, MDC, Meadville, Mo.
5/12 Hollis Crawford, MDC, Cameron, Mo.
5/22 Dean Kreek, Bur. of Reclamation, Denver (retired)
6/25 Bruce P. Stollberg, BSFW, Refuge Resource, Washington, D.C.
6/25 Kermit Dybsetter, Desoto Refuge, Missouri Valley, Ia.
6/26 Arthur C. Storz, Omaha, Nebr.
6/26 John Lovitzen, Omaha, Nebr.
6/26 Jack Pierson, Bigelow, Mo.
6/26 Mike Monico, Omaha, Nebr.
7/3 Lee Burgess, U. of Mo., Columbia, Mo.
7/13 Ron Andrews, Council Bluffs, Ia. - Goose Meeting
7/13 & 14 Harry E. Stiles, R.O., Minneapolis, Minn. - Inspection & Goose Mtng.
7/13 & 14 Wayne E. Sanders, USGMA, Jefferson City, Mo. - Goose Meeting
7/22 Richard Nolt, Curator, St. Joseph, Museum
7/23 Robert Timmerman, Swan Lake Refuge, Sumner, Mo.
7/27 Dr. K.W. Minter, NWMSC, Maryville, Mo., Plant ecology field trip w/14
7/15-18 Richard Meyers, CSC, Warrensburg, Mo, Mammalogy field trip w/18
7/29 Robert P. Sasse, Nature Conservancy, Washington, D.C. - Loess Mounds
8/5 Eldon Heflin, Forester, MDC, St. Joseph, Mo.
8/11 Ralph G. Hayden, USDA Plant Pest Control, Edina, Mo.
8/15 Lee Burgess, U. Of Mo., Columbia, Mo.
8/16 Dave Umberger, Regional Engineer, Minneapolis, Minn. - Drainage
8/18 Jack Wallace, MDC, Brookfield, Mo.
8/18 Bill Serogona, MDC, Moberly, Mo.
8/25-26 Jay Gore, USGMA trainee, Borano, Maine, Orientation
9/1 Paul L. White, USA Corps of Engineers, St. Joseph, Mo. - Mosquito Contrd
9/6 Toher Speed, London England
9/9 W. Elkins, BSFW, C.O., Washington, D.C.
9/22 Jim Shipley, Ia. Cons. Comm., Shenandoah, Ia.
9/22 Dutch Limke, Ia. Cons. Comm., Bedford, Ia.
9/13 Wayne E. Sanders, USGMA, Jefferson City, Mo.
9/13 Thomas W. Piell, Realty, Minneapolis, Minn.
9/14 Harry B. Crandell , Refuge Div., Washington, D.C. - Planning
9/14 Edward S. Crozier, Refuge Div. Minneapolis, Minn. - Planning
9/17-19 Robert H. Wheeler, USGMA, North Platte, Nebr.- Teal enforcement
9/17 Hollis Crawford, MDC, Cameron, Mo. - Teal enforcement
9/16-17 Dick Vaught, MDC, Columbia, Mo. - Goose Management
9/18 Richard Bohanan, MDC trainee, Jefferson City, Mo.
9/19 Dave Easterla, NWMSC, Maryville, Mo.
9/19 Loren J. Bonde, USGMA, Lincoln, Nebr. - Teal enforcement
9/28 Robert G. Personius, Crab Orchard Refuge, Carbondale, Ill.
9/29 Joseph Saylor, MDC, Trimble Wildlife Area, Trimble, Mo.
9/29 C.L. (Buck) Caldwell, MDC, Green Wildlife Area, Ashland, Mo.

9/29 Billie G. Martin, Green Wildlife Area, Ashland, Mo.
10/18 Hollis D. Crawford, MDC, Cameron, Mo.
10/17-18 John D. Bulger, Nat. Audubon Soc., Pulasku, N.Y.
10/18 Lee Burgess, U. of Mo., Columbia, Mo.
10/19-22 Wayne Chord, USGMA, Souix City, Ia. - Enforcement
10/19-11/10 Lou Swenson, AAO, Minot, N.D. - Goose Check Station
10/19-20 Dick Vaught, MDC, Columbia, Mo. - Goose Management
10/19-24 Marvin Duncan, Desoto Refuge, Missouri Valley, Ia.-Goose Check Statio
10/20 MDC Agents Armstrong, Johnson, Stark, Crawford, Clifton & McCloud
10/25 Kermit Dybsetter, Desoto Refuge, - Courtesy enroute Reelfoot NWR
10/25 Paul Ferguson, Union Slough Refuge - " " " "
10/25 Paul Tickner, MDC, Platte City, Mo.
10/23 Dr. Mary Treviariue, Omaha, Nebr. - Birder
10/29-31 MDC Agents Clifton McCloud, Tickner & Crawford
11/1-2 Dr. Bill Green, Winonna, Minn.
11/1-2 Herb Dill, BSFW, R.O., Minneapolis, Minn.
11/3 Ross Hanson BSFW, Minneapolis, Minn.
11/3 H. Jensen, BSFW, Brigham City, Utah
11/4 Marvin Duncan, Desoto Refuge, Missouri Valley, Ia.
11/4 Howard G. Redmon, Oahu, Hawaii
11/5 Dick Vaught, MDC, Columbia, Mo.
11/7 Dennis Holland, Holla Bend Refuge - Courtesy call
11/7 James H. Bartle, Holla Bend Refuge - Courtesy call
11/10 Jay Gore, USGMA trainee, Rock Port, Mo.
11/11 Wayne E. Sanders, USGMA, Jefferson City, Mo.
11/11 Raymond Frandsen, Nebr. Cons. Comm., Falls City, Nebr.
11/14 Dave Olson, Lake Andes NWR
11/14 Don Young, LaCreek NWR
11/14-18 Dr. & Mrs. Harold Hanson, Illinois Natural History Survey - Goose Studies
11/20 Jean Mohr, Geneva, Switzerland - Photos
12/1 David Swendson, USGMA, Fergus Falls, Minn.
12/3 Wesley C. Newcomb, USGMA, Des Moines, Ia.
12/3 Kenneth R. Kakac, Supervisor, Ia. Cons. Comm.
12/5 R. David Purinton, USGMA trainee, Minneapolis, Minn.
12/5 Dave Swendson, USGMA, Fergus Falls, Minn.
12/5 Raymond Franzen, Nebr. Cons. Comm., Falls City, Nebr.
12/14-15 Dick Vaught, MDC, Columbia, Mo. - Goose Studies
12/14-15 Dennis Raveling, Graduate Student, U. of S. Ill. - Goose Studies
12/15 Jim Shipley, Ia. Cons. Comm., Shenandoah, Ia.
12/22 Robert L. Dunkeson, MDC, 10 mile Drive, Jefferson City, Mo.
12/23 Eric Prather, Emporia State College, Emporia, Kans. - Goose Management

C. Refuge Participation

By Harold H. Burgess

1/27 Gave slide talk to members of Grant City, Mo. Womens Club
2/2 Gave slide talk to East Hills Sertoma Club, St. Joseph, Mo.
2/8 Gave slide talk to members of Lions Club at Rosendale, Mo.
2/14-26 Attended Supervisory Training School, Denver, Colarodo
3/10 Talked to Mound City Kiwanis about Wildlife Week, Natural Areas & Master Planning

3/13 Gave slide talk to Northwest Missouri Regional D.A.R. meeting at St. Joseph, Mo.
3/15-18 With Refuge Manager Timmerman attended Mississippi Flyway Technicial sessions and Council Meeting.
3/19 Conducted Squaw Creek Goose Management Meeting with Bureau, Missouri Commission and Ducks Unlimited representatives.
3/21 Explained refuge's objectives and conducted about 100 members of Burrough's Club and Kansas City Branch of University of Missouri on tour of refuge.
3/22-26 Attended Law Enforcement Workshop at Minot, N.D.
3-27-28 Took Explorer Scout Post 71 to Concave at Northwest Missouri State College, Maryville, Mo.
3/30 Attended St. Joseph Audubon Club Meeting
4/4 Assisted Dr. Kucera, U. of Mo., Dr. Meyers, Central State College and David Easterly, K.C. Branch U. of Mo. with inspection of T.E. Whipple loess hills for Nature Conservancy.
4/6 Attended Tri-State Law Enforcement Meeting at Falls City, Nebr.
4/10 With Yocum explained objectives and conducted tour of refuge for 12 members and friends of Highlighters 4-H Club, Watson, Mo.
4/16 Gave slide show to the Friday Morning Business-mens Breakfast Club at St. Joseph, Mo.
4-16-17 Supervised Explorer Post 71 camp and public service program.
4/21 With Yocum showed "Land of Heritage" to Mound City Kiwanis.
4/21 Conducted 15 members attending United Brethern Church Convention, Mound City on tour of refuge.
4/25 Gave slide talk to Redskins 4-H Club, Tarkio, Mo.
4/30 Explained refuge objectives and conducted tour for 14 biology students, Watson, Mo.
5/2 Explained refuge objectives for 60 members and friends of Burlington Junction and Tarkio, Mo. 4-H Clubs.
5/8 Explained refuge objectives and conducted tour for 16 members of Northwest Missouri Biology Club.
5/17 Gave slide talk to Fortescue, Mo. Garden Club
6/16 Conferred with Swan Lake Refuge Manager Timmerman and staff and Missouri Game Research staff regarding regulations.
6/17 With M.D.C. Biologist Vaught attended Missouri Department of Conservation Regulatory Committee Meeting.
6/20 Helped set up Girl Scout Day Camp in Chautaque Park, Mound City, Mo.
6/21 Helped with annual Giant Canada goose roundup at Trimble Game Management Area.
6/21 Presented Waterfowl Tomorrow to Mound City Library Board.
7/13 Conducted meeting of Bureau and Commission personnel on Squaw Creek Goose Management
7/15 Explained refuge objectives and guided 30 members of Central Missouri State College Mammal survey party on tour of refuge.
7/15-18 Assist C.M.S.C. Mammal survey party.
7/27 Explained objectives of refuge to 15 plant ecology students from Northwest Missouri State College.
7/29 Conducted Bob Sasse, Field Representative, Natural Conservancy Inc. and Art Hedges, Mound City Chamber of Commerce on tour of refuge.
7/29-30 Assisted Mr. Sasse obtain information for loess hill survey.
8/1 With Acting Manager Munkres attended Holt Co. Disaster Committee Meeting on post flooding insect-disease control.

9/1 Introduced Biological Aid R. Andrews at Kiwanis Meeting.
9/19 With Andrews made teal hunters performance observations.
9/28 With Ron Andrews & Jerry Gordon attended St. Joseph Audubon Society Meeting.
10/5-6 With Swan Lake Manager Timmerman to Jefferson City-attended Missouri Chapter Wildlife Society Meeting, introducing speaker Flick Davis, M&E Division and attended Federal Project Leaders Meeting.
10/10 Explained refuge objectives to 30 members Graham M.Y.F. group.
10/27 Introduced Biologist Lou Swenson, A.A.O. Minot, N.D. at Kiwanis
11/1&2 Conducted Bureau Biologists Wm. Green and Herb Dill on extensive tour of refuge.
11/3 Conducted Flyway Piolot Biologists R. Hanson and H. Jensen on tour of refuge.
11/14-19 Helped Dr. Harold Hanson, Illinois Natural Histor Survey measure geese and prepare specimens for classification. Conducted informal seminar of Canada goose classification with Dr. Hanson, R. Vaught, Dave Olson (Lake Andes NWR) and Don Young (LaCreek NWR).
11/17 Explain refuge objectives and activities to 26 members of Mound City Kiwanis Club.
11/21 Explained refuge objectives and conducted short/Sunday tour for 200 people.
11/24 With Maintenanceman Boyd as guest, attended Kiwanis-Farmer luncheon at Mound City.
11/26 Conducted Exchange German Student Karen Hobble and hosts on tour of refuge.
11/28 Conducted 80 Sunday visitors on tour of restricted portion of refuge.
12/6-8 Attended Midwest Wildlife Conference, Lansing, Michigan and presented paper "Fowl Cholera outbreak in Northwest Missouri".
12/8-9 Attended Wood Duck Symposium, Lansing, Michigan while on A.L.
1/1/66 Conducted Christmas Bird Count of 7½ mile radius centered on Squaw Creek Refuge, 7 persons participating, observed 55 species, over million birds.

Other Participation - Albert J. Yocum

2/28 & 3/6 Showed film and presided at Cub Pack Meetings.
2/15-19 Attended Law Enforcement Workshop at Valentine, Nebr.
4/6 Attended Mound City Volunteer Fire Department Annual Meeting.
4/7 Gave slide show and talk to 50 students at Forest City School.
4/16 Showed film Land of Heritage to Explorer Scout Post 71 camping at refuge.
4/17 Attended Holt County Disaster Meeting and accepted position on survey committee.
4/19 & 20. Showed film Heritage of Splendor to refuge staff, Kiwanis Club and Girl Scouts.
4/29 Gave slide talk to 50 student at Shubert, Nebr. School.
5/3 Assist Missouri Agent Clifton with pheasant crow count survey.
7/14 Attended Squaw Creek Goose Management Meeting.
7/15 Conducted group of CMSC students on tour of refuge.
8/18 Accompanied Regional Engineer Umberger to Cannon Drainage District Meeting at Oregon, Missouri.
8/20 Helped transport Future Farmers of America for tour of Kansas City Packing Plant, Airport, Zoo and "Athletics" ball game.

9/15 Described refuge and migrations and conducted 30 members of Mound City 5th grade on tour of refuge.
9/18 With Andrews made teal hunters performance observations.
9/28 Attended Tri-State Law Enforcement Meeting at Forney Lake, Ia.
10/5 Explained refuge objectives and conducted tour for 14 members of Oregon, Mo. Garden Club.
10/16 Helped transport Future Farmers of America to American Royal.
10/17 Explained refuge objectives and naturalist Huffman conducted Cub Scout Pack 58, Maitland, Mo. on nature hike.
11/4 Gave slide talk on Squaw Creek to Oregon Garden Club.
11/7 Gave slide talk to 25 members of North Bethel Church.
11/9 Gave slide talk on rare and endangered species to 13 members of Mound City Clio Club.
11/17 & 23 Attended U. of Mo. Extension Service Soils Workshops at Oregon, Mo.
11/28 With illustrated talk, explained refuge objectives to 80 visitors for Sunday tour.

Other Participation - William R. Hamilton

2/15-19 Attended Law Enforcement Workshop, Valentine, Nebraska.
5/10 Showed film "Grass and fire fighting" to refuge staff.
6/4 Assisted with Mound City Community Auto Safety Check.

Other Participation

Refuge Manager Burgess continued as Neighborhood Boy Scout Commissioner and attempted to fill in as Explorer Advisor during 1965. Operator General Hamilton continued as Scoutmaster of Boy Scout Troop 71 and spent part of his annual leave at the Pony Express Council Camp. Wildlife Technician Yocum continued as Cubmaster of Cub Pack 71 during 1965.

Burgess was a member of Mound City Kiwanis; Hamilton was a member of Mound City Lions; Yocum was a member of Mound City P.T.A.; Munkres served as Secretary of the Mound City Odd Fellows and Alva Bomar continued as a member of Forest City Masons.

Harold Burgessand Student-Laborer Lee P. Burgess, Jr. were members of The Wildlife Society and its North Central Section and Missouri Chapter. Harold Burgess was a member of the Mississippi Flyway Technical Section and serves on the Blue-snow goose committee. He was also a member of The Society of American Foresters and was listed in Who's Who in The Midwest. Lee P. Burgess, Jr. was also a member of the American Society of Fisheries and a member of The American Society of Mammalogists. The refuge prepared 17 news releases incorporated in"The Squaw Creek Digest" which were sent to 11 newspapers, 7 radio stations and 3 television stations at periodical intervals.

The November, 1965 issue of Sports Afield carried "diaper-bag geese" by Jim Keefe and Don Woolridge (photographs) - a revision of"The Rag

Bag", (a photo story on decoying snow geese near Squaw Creek Refuge which appeared in the January 1965 Missouri Conservationist). Squaw Creek was again featured in the St. Joseph, Missouri Museum Graphic Fall, 1965 issue in "Bird Watching" by Floyd Lawhon.

There were many requests for reprints of "Blue-winged Teal Nesting Success as Related to Land Use" by Harold Burgess, Harold Prince and David Trauger published in the January, 1965 Journal of Wildlife Management. A recent request for a reprint was received from the University of Aberdeen in Scotland. Refuge Manager Burgess presented "A Fowl Cholera Outbreak in Northwest Missouri Snow geese" atthe 27th Midwest Wildlife Conference at Lansing, Michigan, December 5-8, 1965.

C. Hunting

No hunting was permitted on Squaw Creek National Wildlife Refuge in 1965, but we were concerned with waterfowl hunting directly influenced by the refuge. In recent years we have been concerned with the overharvest of Canada geese and the underharvest o snow geese in this zone. The 1965 goose harvest indicated some correction of this situation.

An experimental teal hunting season was opened September 18-26, 1965. Hunter performance observations indicated a lot of sport with comparatively little violation in this area. Processor's records indicate 440 teal were handled in our check area. If 3.2 teal were bagged for each one processed, as with other ducks in 1964, then 1,408 teal were bagged and 352 were lost through crippling or dropping into rank vegetation for a total of 1,760 teal. An estimated 350 hunting trips were spent in the refuge vicinity. A wet September also provided teal hunting in many outlying areas in this region where ducks are not normally hunted.

In 1965 Squaw Creek Zone hunters were offered a 70 day hunting season on snow, blue and white-fronted geese, with a 30 day season on Canada geese starting October 20th and with an aggregate bag limit of five including only one Canada or two white-fronted geese. Missouri law further required that all Canada geese bagged in the Squaw Creek Zone be registered at established Canada goose Check stations. In contrast to 1964 there was little public outcry against the 1965 Canada goose hunting restrictions.

The regular duck hunting season was open October 29 - December 7, 1965 with an aggregate bag limit of four, including only one mallard and one pintail. A reduction of duck hunters were apparent. Complaints became more numerous and vociferous as the season advanced and the mallards flocked in. It was particularly hard for area hunters to understand the need for the one mallard restriction when the refuge was harboring its most mallards ever. However, most hunters could understand our goals when we explained that we were attempting to fill the empty nesting marshes with breeders for possible future production and populations that were common in the 1950s

The numbers of waterfowl processed during the regular hunting season are listed by reporting periods and calculations for estimating total kills are shown.

Table 16. 1965 Waterfowl processed and total kill based on 1964 area processor data.

	Geese: Snow-blue	White Front	Canadas	Ducks: Mallards	Pintail	other ducks	Total Ducks
10/20-24	360		50				
10/25-31	124		75	93	25	212	330
11/1-7	92	1	66	208	21	120	349
11/8-14	153		74	306	2	97	405
11/15-18	107		52	161	7	48	216
11/19-28	153			466	7	35	508
11/29-12/12	138			363	1	17	381
Total:	1,129	1	317	1,597	63	529	2,189
Bagged: processed	8.18	11	5.2	3.2	3.2	3.2	3.2
Estimated bag:	9,235	11	1,648	5,110	202	1,693	7,005
20% Estimated &&ripples	2,309	3	412	1,278	50	423	1,751
Total Kill	11,544	14	2,060	6,388	252	2,116	8,756

The percent kill of peak 1965 fall populations is shown:

Table 17. Percent kill of peak 1965 population

Species	Canadas	Snow-blue	White-fronted	Mallard	Total Ducks
Peak	7,500	145,500	560	377,000	392,940
Est. kill	1,334*	11,544	14	6,388	8,756
Percent kill	17.8%	7.9%	2.5%	1.7%	2.2%

* Based on compulsory registered kill, see page 24.

In 1964, hunters killed 27,690 units of waterfowl in 25,000 hunter trips for 1.1 waterfowl killed for a trip. If similar success was enjoyed in 1965, then the 21,648 units killed would result from 19,695 waterfowl hunting trips to the Squaw Creek Area.

We estimate an additional 400 hunter trips were used chasing squirrel, cottontails, bob-white, ring-necked pheasants, raccoon and other small game and about 100 deer hunting trips were made into the Squaw Creek area during 1965.

D. Violations

U.S. Game Management Agents and Missouri Department of Conservation Agents again did an excellent job in patrolling the Squaw Creek Zone where in addition to routine duties the burden of enforcing the compulsory check in of Canada geese fell squarely on their shoulders. Two authorized members of the refuge staff helped with patrols, hunters observations and the apprehension of several violators.

The following defendants were processed by Magistrate Judge John Bowes Oregon, Missouri:

Date	Name and address	Violation	Witness	Fine	Costs
5/27	George Edken St. Joseph, Mo.	Take bullfrogs in closed season	Burgess	$5	$12
9/19	Phillip Kneib St. Joseph, Mo.	Take ring-necked duck in closed season	Wheeler	$5	$12
10/20	George Terhune Forest City, Mo.	Failure to check in Canada goose	Vaught, Burgess & Clifton	$10	$12
10/20	George Hopkins St. Joseph, Mo.	Failure to check in Canada goose	McCloud, Clifton & Chord	$10	$12
10/20	Elmer Price Savannah, Mo.	Failure to check in Canada goose	McCloud, Clifton & Chord	$10	$12
10/20	Keith L. Wilmore St. Joseph, Mo.	Over daily bag limit of Canada geese	McCloud, Clifton & Chord	$10	$12
10/20	Dr. E. P. Forgrave St. Joseph, Mo.	Failure to check in Canada goose	McCloud, Clifton & Chord	$10	$12
10/22	Edward Miles Maitland, Mo.	Attempt to take wf. after sunset	Clifton & Crawford	$5	$12
10/22	Jon Marion, Maitland, Mo.	" "	" "	$5	$12
10/23	Kenneth J. Weiman Fremont, Nebr.	Attempt to take wf. before sunrise	Burgess	$10	$12
10/23	Harold Gralifer, Fremont	" "	Burgess	$5	$12
10/29	Wm. Buchier St. Joseph, Mo.	Hunt wf. w/gun capable of holding more than 3 shells	Clifton	$10	$12
10/29	Wm. Dittemore, Dekalb, Mo.	same	McCloud&Ticknor	$10	$12
10/30	Wm. Weaver Independance, Mo.	Attempt to take wf. after sunset	Crawford	$5	$12
10/30	Jerry Howard Kansas City, Mo.	Same	Crawford	$5	$12
10/30	Larry Edson Hemple, Mo.	same	Crawford	$5	$12
10/30	Steve Palmer St. Joseph, Mo.	Attempt to take wf. before sunrise	Clifton	$5	$12
10/30	Charles Rogers St. Joseph, Mo.	same	Clifton	$5	$12
11/6	Robert Staggs St. Joseph, Mo.	Hunt wf. w/gun capable of holding more than 3 shells	Clifton & Crawford	$10	$12
11/12	Ronald Calvert	Attempt to take wf. after sunset	Sanders	$5	$12
11/14	Charles Wm. Dawson St. Joseph, Mo.	Attempt to take wf. before sunrise	Sanders	$5	$12
11/14	Steven Gray Marysville, Mo.	same	Sanders	$5	$12
By: U.S. Commissioner Gehrs, St. Joseph, Missouri					
10/1	McDonald, Wilbur P. MD St. Joseph, Mo.	Overlimit mallards	Hague & Purinton	$75	$16
10/29	Burris, Robert G. St. Joseph, Mo.	Take wf. while motor-boat underway	Sanders	$25	$16
12/7	Cox, Stanley W. St. Joseph, Mo.	Unsigned Duck Stamp Overlimit mallards	Hague & Purinton	$10 $50	$16

Date	Name and address	Violation	Witness	Fine	Costs
12/18	Thompson, William D. Gladstone, Mo.	Attempt to take wf. after sunset	Hague & Burgess	$25	$16
12/18	Beckwith, Joel K. Gladstone, Mo.	Attempt to take wf. after sunset	Hague & Burgess	$25	$16

A Bureau of Sport Fisheries and Wildlife Criminal Investigator charged Tavern-keeper Calvin Rogers, Rulo, Nebraska and of Craig, Missouri of commercialization and over possession of waterfowl during late 1965. This case which has many implications in our area, was pending U.S. District Court hearing as the year ended.

F. Safety

On December 31, 1965 our safety record had reached 1,018 days without a lost time accident. Safety meetings were held monthly in 1965 and new employees or assignees were oriented on this phase of operations before they were permitted to start other activities.

A safety hazard inventory was made during the year and submitted in October. The safety committee is working on a safety management plan which should be completed in early 1966.

VII Other Items

A. Items of Interest

1. The Corps of Engineers have continued to promote reactivation of their Squaw Creek Ditch proposal. The area below the refuge is organized but construction funds may be delayed by the "Viet Nam situation".

2. The Holt County Loess Hill Foundation has acquired the 200 acre Todd Hill Area adjacent to the refuge. They plan to acquire about 100 more adjoining acres of this unique-scenic area to manage in cooperation (?) with the Nature Conservancy group. This partnership will be observed with interest since the "promoters" in the Foundation have some very divergent views from the objectives of the Conservancy.

3. The spring visit of a flamingo brought thousands of sightseers to the refuge. The occurance of two (Atlantic) Brant in hunters bags were almost as unusual. Sightseers will be able to see these as mounted specimens in the refuge's and St. Joseph, Missouri museums.

4. Maintenanceman Henry Munkres retired at the close of business December 30, 1965. A neighbor and former teacher, Mr. Munkres started at Squaw Creek as a laborer-patrolman in March, 1938 and except for several years in the airforce's Burma theater, has served this refuge well. For the past three years Mr. Munkres

has served as acting manager during the manager's absence. On January 10, 1966, Assistant Regional Refuge Supervisor Harry Stiles presented Mr. Munkres with the Bureau's Commendable Service Award at a staff dinner held in his honor. We will miss Henry and his sage advice.

5. This report was drafted by Harold Burgess. The visitors section was compiled by Biological Technician A. J. Yocum, who typed the report except for Parts III and IV which were typed by Mrs. Harold Burgess. Mrs Burgess also proof read the report.

B. Photographs

Photographs by Don Reynolds, St. Joseph Museum, Lou Swanson, Area Acquisition Office, Devils Lake, North Dakota and members of our staff are attached.

SIGNATURE PAGE

Submitted by:

Harold H. Burgess
(Signature)
Harold H. Burgess

Date: February 26, 1966

Refuge Manager
Title

Approved, Regional Office:

Date: March 1, 1966

Harry E. Stiles
(Signature)

Assistant
Regional Refuge Supervisor

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Squaw Creek MONTHS OF January TO April 29, 19 65

(1) Species	(2) Weeks of reporting period 1/1-7	1/8-14	1/15-21	1/22-28	1/29-2/4	2/5-11	2/12-18	2/19-25	2/26-3/4	3/5-11
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada Large	6,050	6,600	6,000	6,000	6,000	2,000	4,500	4,500	4,500	7,410
Canada Small	100	70	70	70	70	10	20	20	20	300
Brant										
White-fronted	25	25	25			28				120
Snow	7,500	6,400	6,400	5,000	5,000		8,000	6,000	3,000	12,000
Blue	2,500	1,000	1,000	1,000	1,000		5,800	2,500	2,000	48,000
Total Geese	16,175	14,095	13,495	12,070	12,070	2,038	18,320	13,020	9,520	67,830
Ducks:										
Mallard	110,000	80,000	50,000	30,000	6,000	6,000	90,000	20,000	3,000	91,500
Black	500	400	210	150	30	30	440	300	30	100
Gadwall										10
Baldpate	1,200	1,200	1,200	900				100		50
Pintail	70	70	70	40			1,000	250	100	62,130
Green-winged teal	110	50	30	20				10	10	1,500
Blue-winged teal										
Cinnamon teal										
Shoveler										10
Wood									10	20
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye								30		50
Bufflehead										10
Ruddy										
Other Common Merganser	180	100	100	50		150	100	150	20	250
Total Ducks	112,060	81,820	51,610	30,260	6,030	6,180	91,540	20,840	3,160	155,630
Coot:										

Int. Dup. Sec., Wash., D.C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Squaw Creek MONTHS OF January TO April 29, 19 65

(1) Species	(2) Weeks of reporting period: 3/12-18 11	3/19-25 12	3/26-4/1 13	4/2-8 14	4/9-15 15	4/16-22 16	4/23-29 17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada - Large	8,400	8,500	9,000	2,950	180	90	12		578,844		
Cackling - Small	415	400	200	1,490			11		22,862		
Brant											
White-fronted	250	2,010	630	900	220	120	1		30,478		
Snow	81,700	100,000	88,000	5,000	3,000	300	19		2,361,233		
Blue	134,600	200,000	98,000	6,500	2,000	200	5		3,542,735		
Other Total Geese	225,365	310,910	195,830	16,840	5,400	710	48		6,536,152		
Ducks:											
Mallard	95,525	65,000	38,950	4,820	350	300	110		4,840,885		
Black	300	460	100	20					21,490		
Gadwall	50	60	100	2,020	1,020	650	550		31,220		
Baldpate	100	140	100	1,350	1,000	510	200		56,350		
Pintail	126,000	145,000	111,460	480	120	50	20		3,128,020		
Green-winged teal	4,000	5,200	6,020	6,120	2,140	740	700		514,150		
Blue-winged teal		20	100	480	5,300	1,810	2,700		72,870		
Cinnamon teal											
Shoveler	220	300	1,010	1,800	6,000	1,500	2,700		94,780		
Wood	40	90	100	16	100	50	10		3,052		
Redhead	10	20	10	2	3				315		
Ring-necked		10	110	50	2	5			1,239		
Canvasback			10						70		
Scaup	10	60	110	3,000	1,020	110	70		30,660		
Goldeneye	50	10	20						1,120		
Bufflehead	20	10	10	10	5	25	10		700		
Ruddy		1	10	4	30	10			305		
Other Common Merganser	2,240	10	400	20	10	10			26,530		
Hooded Merganser			10						70		
Total Ducks	218,525	216,401	158,630	20,192	17,100	5,770	7,070		8,823,906		
Coot:	15	15	178	7,500	8,200	2,000	1,050		132,650		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	6,536,152	310,910	
Ducks	8,823,906	218,525	
Coots	132,650	8,200	

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by Harold H. Burgess, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

762 42

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE ~~SQUAW CREEK~~ MONTHS OF ~~April 30~~ TO ~~August 31~~, 19 ~~65~~

(1) Species	Weeks of reporting period (2) 1 4/30-5/6	2 5/7-13	3 5/14-20	4 5/21-27	5 5/28-6/3	6 6/4-10	7 6/11-17	8 6/18-24	9 6/25-7/1	10 7/2-8
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling Large	4	11	10	10	10	9	8	8	8	8
Cackling Small	1	2	2	2	2	2	2	2	2	1
Brant										
White-fronted										
Snow										
Blue	6	8	4	2	3	2	2	2	2	none
Other	4	2	3	3	3	1	1	2	2	none
Total Geese	15	23	19	17	18	14	13	14	14	9
Ducks:										
Mallard										
Black	110	60	40	40	40	50	50	32	32	18
Gadwall										
Baldpate	20	30	40	10	4	4				
Pintail	10	10	10	10	10					
Green-winged teal	30	30	10	10	12					
Blue-winged teal	60	30	30	10						
Cinnamon teal	360	320	120	60	20	20	16	8	8	2
Shoveler	0	1	0	0	0					
Wood	550	20	50	10	10	10	4			
Redhead	10	3	10	10	10	12	12	12	10	4
Ring-necked										
Canvasback										
Scaup		3								
Goldeneye	40	20	16	9	2	2	2	2		
Bufflehead										
Ruddy		2	2							
Other		1	2	1	2	2				
Total	1190	530	330	170	110	100	90	64	52	28
Coot:										
	200	110	60	10	6	2	2			

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3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Squaw Creek MONTHS OF April 30 TO Sept. 2, 19 65

(1) Species	(2) Weeks of reporting period: 7/9-15 (11)	7/16-22 (12)	7/23-29 (13)	7/30-8/5 (14)	8/6-12 (15)	8/13-19 (16)	8/20-26 (17)	8/27-9/2 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada - Large	8	8	8	8	8	6	8	6	1,022		
Cackling - Small	1	1	1	1					154		
Brant											
White-fronted											
Snow											
Blue		1	1	1					217		
Other Total Geese	9	10	m 10	10	8	6	8	6	1,561		
Ducks:											
Mallard	18	14	30	43	8	4	80	80	5,243	2	13
Black											
Gadwall									756		
Baldpate									364		
Pintail	2			4			90	520	5,068		
Green-winged teal									938		
Blue-winged teal	2	4	4	3	30	30	40	590	11,445		
Cinnamon teal									7		
Shoveler									4,578		
Wood	4	8	10	10	10	10	10	20	1,225	1	8
Redhead											
Ring-necked											
Canvasback									21		
Scaup									651		
Goldeneye											
Bufflehead									28		
Ruddy									56		
Other											
Total Ducks	26	26	44	60	48	44	220	1,210	30,380	3	21
Coot:									2,730		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	1,461	22	
Ducks	32,382	1,212	21
Coots	2,737	200	

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by Harold H. Burgess, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE SQUAW CREEK

MONTHS OF September 3 TO December 31, 19 65

(1) Species	Weeks of reporting period (2)									
	9/3-9 (1)	9/10-16 (2)	9/17-23 (3)	9/24-30 (4)	10/1-7 (5)	10/8-14 (6)	10/15-21 (7)	10/22-28 (8)	10/29-11/4 (9)	11/5-11 (10)
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada - Large	6	6	5	2,200	2,300	2,700	2,930	2,930	3,100	4,900
Cackling -Small				20	150	200	1,570	1,570	1,500	2,180
Brant								1		
White-fronted				10	560	100	130	130	100	50
Snow		8	18	10,480	24,500	69,000	69,000	24,000	54,000	104,250
Blue		21	2	2,620	12,500	46,000	46,000	16,000	23,000	34,750
Other Total Geese	6	35	25	15,330	40,010	118,000	119,630	44,631	81,700	146,130
Ducks:										
Mallard	110	240	350	830	12,630	27,300	72,300	157,400	150,000	156,400
Black			20	10	10	300	260	570	500	750
Gadwall				10	100	300	300	650	600	300
Baldpate	10	10	10	60	330	300	400	1,150	1,000	210
Pintail	980	4,240	11,200	42,500	73,500	30,100	32,200	54,100	50,000	8,500
Green-winged teal	110	660	110	2,030	1,920	6,600	8,510	8,800	9,000	6,000
Blue-winged teal	1,910	2,350	11,040	35,970	18,950	7,100	3,600	100		50
Cinnamon teal										
Shoveler		10	40	140	160	300	350	660	600	900
Wood	30	120	40	90	150	140	140	100	100	40
Redhead						10	10	300	100	50
Ring-necked					10	10	10	550	500	600
Canvasback										
Scaup								1,600	9,000	1,100
Goldeneye										
Bufflehead									10	10
Ruddy										200
Other Hooded Merganser									10	10
Total Ducks	3,150	7,630	22,810	81,650	107,750	72,460	118,080	225,980	221,420	175,120
Coot:	10	10	70	900	5,780	6,500	6,100	3,500	3,000	300

Int. Dup. Sec., Wash., D.C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE SQUAW CREEK MONTHS OF Sept. 3 TO December 31, 19 65

(1) Species	(2) Weeks of reporting period: 11/12-18 (11)	11/19-25 (12)	11/26-12/2 (13)	12/3-9 (14)	12/10-16 (15)	12/17-23 (16)	12/24-30 (17)	12/31/65 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada - Large	5,200	6,000	5,300	5,700	5,700	6,000	6,250	6,250	434,839		
~~Cackling~~ -Small	1,300	1,500	1,320	300	100	50	230	230	84,160		
Brant									7		
White-fronted	123,000	142,000	145,500	71,000	77,900	76,500	60,000	60,000	7,560		
Snow	98,000	113,600	116,400	41,000	51,100	51,000	45,000	45,000	6,144,492		
Blue	25,000	28,400	29,100	30,000	26,800	25,500	15,000	15,000	2,539,851		
~~Lesser~~ Total Geese	123,500	149,500	152,120	78,000	83,700	82,550	66,480	66,480	9,168,909		
Ducks:											
Mallard	200,000	375,000	377,000	200,000	173,500	173,500	100,000	100,000	15,335,920		
Black	980	1,870	1,890	1,200	1,500	1,500	500	500	82,120		
Gadwall									15,820		
Baldpate	200				10		20	20	25,990		
Pintail	1,000	330	130	320	300	100	10	10	2,166,580		
Green-winged teal	7,500	6,600	3,100	1,000	1,000	3,000	50	50	420,400		
Blue-winged teal	60	10	10	10	10				568,190		
Cinnamon teal											
Shoveler	1,000	500	500		20	20	10	10	36,480		
Wood	30	10	10			10			7,070		
Redhead		10	10						3,430		
Ring-necked	100		10						12,530		
Canvasback		10							70		
Scaup	1,000	10	10						89,040		
Goldeneye											
Bufflehead	10								210		
Ruddy	500	10	10	10					5,110		
Other Hooded Merganser	10	10	10			10			420		
Common Merganser	50	250	250	100	300	300	460	460	12,430		
Total Ducks	212,440	384,620	392,940	202,440	176,640	178,440	101,050	101,050	18,823,390		
Coot:		10	10		10	10			183,470		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	9,168,909	149,500	
Ducks	18,823,390	384,620	
Coots	183,470	6,500	

SUMMARY

Principal feeding areas West Pools, A-16 flooding and refuge wheat and corn fields.

Principal nesting areas

Reported by Harold H. Burgess
Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

16242

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Squaw Creek Months of January 1 to April 30, 1965

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number Days Use
I. Water and Marsh Birds:										
White pelican	30	4/5	5,000	4/9-15	280	4/29				40,000
Pied-billed grebe	1	3/31	12	4/16-22	4	4/29				300
Eared grebe	2	4/11	10	4/16-22	4	4/29				100
Double-crested cormorant	4	4/5	140	4/6-15	26	4/29				1,400
Great blue heron	1	3/31	5	4/23-29	5	4/29				30
B.c. night heron	6	4/9	14	4/23-29	14	4/29				100
Common egret	1	4/4	3	4/23-29	3	4/29				30
Green heron	4	4/16	4	4/23-29	4	4/29				30
American bittern	1	4/18	1	4/18-29	1	4/29				10
Sora	1	4/28	2	4/28-29	2	4/29				6
II. Shorebirds, Gulls and Terns: Killdeer	11	3/16	50	4/1-29	50	4/29	20	20		1,500
Semi-palmated plover	4	4/7	4	4/18-29	2	4/29				50
Common snipe	1	1/1	4	4/1-29	4	4/29				120
American avocet	3	4/25	4	4/25-29	4	4/29				20
Spotted sandpiper	1	4/23	6	4/24-29	6	4/29				40
Long-billed dowitcher	1	4/18	200	4/28-29	200	4/29				1,400
Hudsonian godwit	12	4/18	12	4/18-29	12	4/29				150
Pectoral Sandpiper	5	4/1	20	4/16-29	20	4/29				300
Semi-palmated Sandpiper	20	4/18	20	4/18-29	20	4/29				200
Lesser yellowlegs	5	4/5	145	4/16-29	145	4/29				2,100
Greater yellowlegs	1	4/7	2	4/7-29	2	4/29				50
Wilsons phalarope	1	4/18	100	4/23-29	100	4/29				700
Ring-billed gull	8	2/27	125	3/15-4/29	125	4/29				5,500
Franklin gull	1	4/1	2,030	4/23-29	2,030	4/29				15,000
Forster's tern	2	4/16	4	4/23-29	4	4/29				30

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										Days use
Mourning dove	2	1/1/65	100	4/2-29	100	4/29	1	6		3,000
White-winged dove										
IV. Predaceous Birds										
Golden eagle	1	1/1	2	2/1-3/17	1	3/30				100
Duck Hawk	1	4/1	2	4/1-30	1	4/30				60
Horned owl	4	1/1	8	3/1-4/30	8	4/30	2	2	4	500
Barred owl	4	1/1	6	3/1-4/30	6	4/30	1	1	2	400
Screech owl	4	1/1	4	4/1-30	4	4/30				200
Crow	100	1/1	500	4/1-15	1	3/20				10,000
Sharpshinned hawk	1	3/20	1	3/20	1	3/20				1
Coopers hawk	1	1/26	2	2/1-4/24	1	4/29				240
Marsh hawk	6	1/1	18	3/26-4/22	2	4/22				600
Rough-legged hawk	2	1/1	6	1/1-3/30	1	4/18				540
Harlans hawk	2	1/1	2	1/1-3/26	2	3/26				180
Red-tail hawk	7	1/1	21	3/26-4/22	4	4/29				630
Bald eagle(12A:28I)	40	1/1	40	1/1-30	1	3/31				1,500
Short-eared owl	2	1/1	20	3/2-31	1	3/31				60
Barn owl	1	3/20	1	3/20	1	3/20				1
Sparrow hawk	1	1/1	12	4/16-29	4	4/29				180
Osprey	1	4/22	1	4/22	1	4/22				1
Broad-winged hawk	1	4/18	1	4/18	1	4/18				1
Turkey vulture	1	4/1	8	4/18-29	8	4/29				120

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total num[illegible] of the species using the refu[illegible] during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Squaw Creek Months of April 30 to Sept. 2 1955

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
										Days use
I. Water and Marsh Birds:										
Eared grebe	2	4/30	2	4/30-5/13	2	5/13				30
Pied-billed grebe	1	4/30	1	6/1-8/26	1	8/26				60
White pelican	100	4/30	100	4/30-5/6	100	9/2				700
D.C. Cormorant	1	7/6	1	7/6-9/2	1	9/1				30
Great Blue Heron	5	4/30	64	8/20-92	64	9/2				1500
Green Heron	4	4/30	6	4/30-9/2	6	9/2	1	1	2	720
Little Blue Heron	1	5/2	7	7/18-8/26	3	9/2				60
Common Egret	1	4/30	3	5/21-27	1	9/2				30
B. C. Night Heron	6	4/30	11	8/27-9/2	11					80
Y. C. Night Heron	1	4/30	1	4/30	1	4/30				10
Least Bittern	2	6/19	2	6/19-25	2	6/19				14
American Bittern	1	4/30	1	4/30-5/20	1	5/20				20
Flamingo	1	5/13	1	5/13-6/20	1	6/10				30
Sora	3	4/30-6/3	10	8/28-9/2	7	9/2				70
Virginia Rail	2	8/29	2	8/29-9/2	2	9/2				10
II. Shorebirds, Gulls and Terns:										
Killdeer	Last Period				12	8/1-31	1	1	4	1000
Semi-palmated Plover	"	"	100	4/30-5/13	3	7/30				1400
Piping Plover	1	5/2	1	5/2	1	5/2				1
Snowy Plover	1	5/2	1	5/2	1	5/2				1
American Golden Plover	2	5/2	12	5/14-20	12	5/20				90
Black-bellied Plover	4	5/2	60	5/14-20	1	8/5				450
Ruddy Turnstone	2	5/9	8	5/14-20	8	5/20				60
Common Snipe	Last Period		5	8/29-9/2	5	9/20				40
Whimbrel	1	5/17	1	5/17-26	1	5/26				10
Spotted Sandpiper	Last Period		6	4/30-7/29	2	9/2				360
Solitary Sandpiper	2	5/2-6/30	20	7/30-8/5	3	8/5				150
Lesser Yellowlegs	Last Period		13	4/30-5/6	5	7/15				1000
Pectoral Sandpiper	Last Period		500	5/7-20	130	7/30				7000
White-rumped Sandpiper	500	5/9	500	5/7-20	200	6/3				7000

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								Days use
Mourning dove White-winged dove	Last Period		400	8/22-28	200	9/2		40000
IV. Predaceous Birds:								
Golden eagle								
Duck hawk								
Horned owl	Last	Period	2	5/9-16	2	5/16		14
Magpie	Last	Period	12	5/23-9/2	2	9/2		840
Raven								
Crow	Last	Period	30	5/1-9/2	30	9/2		2700
Red-tailed Hawk	Last	Period	4	4/30-9/2	4	9/2		480
Swainson's Hawk	1	4/16	1	4/16	1	4/16		1
Sparrow Hawk	Last	Period	2	4/30-9/2	2	9/2		240
Barred Owl	Last	Period	8	4/30-9/2	4	9/2		1060
Screech Owl	Last	Period	4	7/1-9/2	2	9/2		480
Turkey Vulture	Last	Period	14	5/14-20	2	9/2		140

Reported by Harold H. Burgess, Refuge Manager

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total numb of the species using the refu during the period concerned.

INT.-DUP. SEC., WASH., D.C.

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Sahwah Creek Months of April 10 to September 2 1965

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
~~I. Water and Marsh Birds:~~										
II. Shorebirds - Cont.										
Bairds Sandpiper	30	5/9	30	5/7-13	18	7/15				210
Least Sandpiper	500	5/9	500	5/9-15	10	5/22				3500
Dunlin	15	5/8	15	5/8-14	4	5/23				100
Stilt Sandpiper	60	5/9	160	5/14-20	160	5/20				1120
Semi-palmated Sandpiper	Last	Period	500	5/7-13	20	8/13				4000
L. B. Dowitcher	3	7/15	3	7/15	3	7/15				3
Western Sandpiper	1	5/16	1	5/16	1	5/16				1
Buff-breasted Sandpiper	5	5/13	6	5/13	6	5/13				6
Marbled Godwit	2	5/6	2	5/6	2	5/6				2
Hudsonian Godwit	Last	Period	90	5/7-13	60	5/20				1050
Sanderling	4	5/9	20	5/14-20	20	5/20				170
II. Shorebirds, Gulls and Terns: (continued)										
American Avocet	Last	Period	3	5/14-20	3	5/20				60
Wilson's Phalarope	Last	Period	1000	5/7-13	20	5/16				14000
Northern Phalarope	5	5/16	5	5/14-20	5	5/20				35
Herring Gull	3	5/6	3	5/6-7	3	5/7				6
Ring-billed Gull	Last	Period	36	5/7-13	1	6/3				300
Franklin Gull	Last	Period	100	5/14-6/6	2	9/2				3000
Forster's Tern	Last	Period	20	6/22-9/2	2	9/2				1200
Caspian Tern	1	5/9	4	7/15-21	1	8/12				50
Black Tern	60	5/7	500	5/14-9/2	300	9/2				30000
Least Tern	2	5/30	2	5/30-8/30	2	8/29				180

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove					
White-winged dove					
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl					
Magpie					
Raven					
Crow					

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total numb of the species using the refu during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Squaw Creek Months of September 3 to December 31 1965

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number DAYS USE
I. Water and Marsh Birds:										
Pied-billed grebe	Present last period		30	9/23-29	1	11/12				90
Western grebe	2	10/2	3	10/2-8	3	10/3				20
Horned grebe	1	10/3	1	10/3	1	10/3				1
Eared grebe	1	10/3	1	10/3	1	10/3				1
White pelican	Present last period		5,000	9/2-22	14	11/21				100,000
Double-crested cormorant	Present last period		120	9/16-22	1	11/2				1,200
Great blue heron	Present last period		50	0/1-10/10	3	11/21				3,000
Green heron	Present last period		2	9/1-21	1	9/21				40
Common egret	Present last period		5	9/1-21	5	9/21				100
Black-crowned night heron	Present last period		4	10/1-11/21	4	11/21				200
Yellow-crowned night heron	Present last period		4	9/23-29	1	10/2				25
Least bittern	Present last period		2	9/1-30	1	9/26				60
American bittern	1	11/7	1	11/5-11	1	11/7				300
Glossy ibis	2	9/18	5	9/18-23	2	9/18-23				30
King rail	1	11/7	1	11/5-11	1	11/7				7
II. Shorebirds, Gulls and Terns: Killdeer	Present last period		10	9/1-30	4	12/24				300
Black-bellied plover	10	9/26	10	9/26-31	10	9/26				60
Avocet	2	10/1	2	10/1-7	2	10/1				14
L.b. dowitcher	3	10/7	30	10/8-20	30	10/18				360
Common snipe	Present last period		100	9/18-24	2	11/20				1,000
Ringed-billed gull	Present last period		20	10/1-7	12	12/31				1,200
Franklin's gull	2	9/26	20	10/1-7	20	10/7				140
Forster's tern	Present last period		4	9/19-15	4	9/9				28
Caspian tern	4	9/16	4	9/12-18	4	9/16				24
Black tern	Present last period		1	10/16-22	1	10/18				7

(over)

(1)	(2)	(3)		(4)		(5)	(6)
III. Doves and Pigeons:							
Mourning dove	Present last period	100	9/1-10/1	2	12/31		DAYS USE 6,000
White-winged dove							
IV. Predaceous Birds:							
Golden eagle	1 I 10/1	55	12/1-31	15A 40I	12/31		1,650
Bald eagle							
Duck hawk	1 9/19	2	9/19-10/10	1	10/10		50
Horned owl	Present last period	20	9/1-12/31	7	12/31		2,400
Barred owl	Present last period	4	9/1-12/31	2	12/15		480
Screech owl	Present last period	2	9/1-12/31	2	12/15		240
Magpie							
Raven							
Crow	Present last period	40	10/1-12/31	40	12/31		2,400
Coopers hawk	Present last period	2	9/23-12/31	2	12/15		180
Red-tailed hawk	Present last period	20	12/1-12/31	20	12/31		1,000
Harlan hawk	2 10/9	2	10/9-12/31	1	12/31		140
Roughlegged hawk	2 12/1	2	12/1-31	2	12/31		60
Marsh hawk	Present last period	4	10/1-31	2	12/31		120
Pigeon hawk	1 9/21	2	9/21-10/21	1	10/21		60
Sparrow hawk	Present last period	2	9/1-12/31	1	12/15		240

Reported by Harold H. Burgess, Refuge Manager

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750
Form NR-1B
(December 1956)

UNITED STATES
DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Squaw Creek For 12-month period ending August 31, 1965

Reported by Harold H. Burgess Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage	(3)	(3) Use-days	(4) Breeding Population	(5) Production
I	Crops	157	Ducks	5,250,635	65	13
	Upland	91	Geese	4,061,513		
	Marsh	542	Swans			
	Water	70	Coots	78,451	3	
	Total	870	Total	9,390,599	68	13
II	Crops	410	Ducks	479,033	10	8
	Upland	200	Geese	505,645		
	Marsh	250	Swans			
	Water	20	Coots			
	Total	880	Total	984,678	10	8
III	Crops	510	Ducks	1,232,088	5	0
	Upland	70	Geese	1,233,165		
	Marsh	290	Swans			
	Water	100	Coots	2,100		
	Total	970	Total	2,467,353		
IV	Crops	155	Ducks	1,134,820	5	0
	Upland	120	Geese	165,656		
	Marsh	265	Swans			
	Water	10	Coots			
	Total	550	Total	1,300,476	5	0
V	Crops	30	Ducks	9,085,834	24	0
	Upland	10	Geese	7,194,184		
	Marsh	1166	Swans			
	Water	1012	Coots	200,620		
	Total	2218	Total	16,480,638	29	0
VI	Crops	150	Ducks	2,804,116	2	0
	Upland		Geese	769,426		
	Marsh	1145	Swans			
	Water	26	Coots	4,900		
	Total	1321	Total	3,578,442	2	0
TOTALS	Crops	1412	Ducks	20,196,517	119	21
	Upland	491	Geese	13,929,589	5	0
	Marsh	3568	Swans			
	Water	1238	Coots	286,071	3	0
	Total	6859	Total	34,412,177	127	21

(over)

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August narrative report.

INSTRUCTIONS

(1) Area or Unit: A geographical unit that, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. Estimated acreage of each unit should be indicated.

(2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland consists of all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type including wet meadow and deep marsh; and the water category includes all other water areas inundated most or all of the growing season and extends from the deeper edge of the marsh zone to strictly open-water areas, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for each type should be kept as accurate as possible through reference to available maps supplemented by periodic field observations and should agree with unit acreage.

(3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven.

(4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.

(5) Production: Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C.
1956

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Squaw Creek Months of January to April 30, 1965

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	3,455 acres of upland crops, brush and forbs	34			1:1	NONE			100	
Bob-white quail	Same as above	69			1:1	NONE			50	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Squaw Creek Months of May 1 to September 2, 1965

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked pheasant	3,500 acres of upland crops, brush and herbs	17	10	150	1:1	N O	N E		200	
Bob-white quail	same	58	5	50	No data	N O	N E		60	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Squaw Creek Months of September to December, 19 65

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	3,500 acres of upland crop, brush and forbs.	17	10	150	1:1	NONE			200	
Bob-white Quail	Same	58	6	.60	No data	NONE			60	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Squaw Creek Calendar Year 1965

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer		50										100	100	No data.

Remarks:

Reported by Harold H. Burgess, Refuge Manager

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1755
Form NR-5
60701

DISEASE

Refuge Squaw Creek Year 19 65

Botulism None.

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks _____

Lead Poisoning or other Disease

Kind of disease Lead poisoning

Species affected Mallard, Canadas and Snow geese

Number Affected Species	Actual Count	Estimated
Mallard	50	1,000
Canada geese	2	20
Snow geese	2	20

Number Recovered 520

Number lost 520

Source of infection Hunting ponds

Water conditions Plentiful

Food conditions Excellent

Remarks Reduced hunting resulted in less than normal spent lead available.

NR-6

Bureau of Sport Fisheries and Wildlife

PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge Squaw Creek Calendar Year 1965

1. Visits

a. Hunting None b. Fishing 2,000 c. Miscellaneous 14,180 d. TOTAL VISITS 16,180

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl			
Upland Game			
Big Game			
Other			

Number of permanent blinds

Man-days of bow hunting included above

Estimated man-days of hunting on lands adjacent to refuge 20,500

20,000-Waterfowl
400-Small game
100-Deer

1b. Fishing (area open to fishing on refuge lands)

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	1,000	
Streams and Shores		10

1c. Miscellaneous Visits

Recreation 12,680 Official 300

Economic Use 1,200 Industrial

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	On Refuge NO. OF GROUPS	On Refuge NUMBER IN GROUPS	Off Refuge NO. OF GROUPS	Off Refuge NUMBER IN GROUPS
Sportsmen Clubs				
Bird and Garden Clubs	2	106	11	827
Schools	3	160	2	56
Service Clubs			17	352
Youth Groups	10	192	2	23
Professional-Scientific	4	120	1	100
Religious Groups	2	55		
State or Federal Govt.	1	10	22	70
Other	2	160		

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	17	*Radio Presentations	17
Newspapers (P.R.'s sent to)	11	Exhibits	12
*TV Presentations	17	Est. Exhibit Viewers	2,000

3-1756
(Rev. 4/63)

*All news releases also sent to radio and TV.

INSTRUCTIONS

Item 1: Total of a, b, and c, equal d.

"Visit" - definition. Any person who is on refuge lands or waters during a day or part thereof for the purpose of: hunting, fishing, bird-watching, recreation, business or economic use, official visit, or similar interest. INCLUDE - those who stop within the refuge while traveling on a public highway because of an interest in the area. EXCLUDE - persons engaged in oil or other industry not directly related to the refuge, persons using refuge as most direct route or principal avenue of traffic, and those boating on navigable rivers or the Intercoastal Canal, unless they stop to observe wildlife on the refuge.

Computing visits. Where actual counts are impractical, "sampling" is used with midweek and week-end samples varied by season or weather. A conversion factor of 3.5 (of passengers per car) is used when accurate figures are not available. Each refuge will develop a conversion factor for boats based on range of usage. Count a camper once for each 24-hour period or fraction thereof.

Item 1a: Acres - of refuge open for each type of hunting.

Managed hunts require check in and out of hunters, issuance of permits, or assignment of blinds.

Other - INCLUDE crow, fox, and similar hunting.

Lands adjacent to refuge. Normally considered within 1 mile or less of boundary, unless established sampling procedures cover a wider area. For big game hunting, the distance may be greater.

Item 1b: Acres of streams open to fishing, if practical; otherwise just miles open. Information on "shores" is primarily for coastal fishing.

Item 1c: Recreation. INCLUDE photography, observing wildlife, picnicking, swimming, boating, camping, visitor center use, tours, etc. TOTAL Recreation, Official, and Economic Use visits under Item 1.

Industrial. INCLUDE persons engaged in industry, i.e., oil industry or factories. EXCLUDE these from Item 1.

Item 2: INCLUDE the "On Refuge" groups in Items 1c and 1. In "Off Refuge" column include only those group meetings in which refuge employees actually participate. EXCLUDE these from Items 1c and 1.

Item 3: Exhibits - INCLUDE displays, fairs, parades, and exhibits OFF the refuge; EXCLUDE those ON.

3-1758
Form NR-8
(Rev. Jan. 1956)

sh and Wildlife Service Bran of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge **Squaw Creek** County **Holt** State **Missouri**

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return Harvested		Government's Share or Return Unharvested		Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Corn	343.4	19,708			317.6	26,275	791		
Milo					36	720	36		
Domestic Millets					90		90		
Oats	7	40					7		
Wheat	22	800	12	360	138	1,380	150	**Wheat**	324.5
Pop Corn	2/3A.	15			1/3A.	5	1	**Rye**	15
Soybeans	133.5	4,430					133.5		
								Fallow Ag. Land.	

No. of Permittees: Agricultural Operations **8** Haying Operations **3** Grazing Operations **0**

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
Reed Canary & Brome	12.5	12	25.00	1. Cattle				
Grass-legume	8	8	24.00					
Alfalfa	25	15	———	2. Other				
				1. Total Refuge Acreage Under Cultivation				1,431
Hay - Wild				2. Acreage Cultivated as Service Operation				559.5

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only thenumber of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvesed column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

3-1570
NR-58
(4/54)

REFUGE GRAIN REPORT

Refuge Squaw Creek — Months of January 1 through December 31, 1965

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Corn - Shelled	400	250	650			450	450	200		200	
Corn - Ear	300		300			200	200	100		100	
Wheat, winter	150	560	710		548	62	600	100		100	
Rye - Balboa	2		2		2	2	2				
Rye - Elbon		7	4		7		7				
Brome grass	8	50	58		8			50	50		

Squaw Creek Refuge, Mound City, Mo.

(8) Indicate shipping or collection points Headquarters corn cribs & graineries.

(9) Grain is stored at

(10) Remarks

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DEP. SEC., WASH., D.C. 17065

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 1

Reporting Year: 1965

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Applicatio
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5/4-6/27	Foxtail & other weeds in corn	A-1,3,4,5,6,8,9,12, 14,16,17,18,19	475	Atrazine	950 lbs.	2 lb/A	Water 20 gal/A	Ground spray except Aerial on A-4 & A-16

10. Summary of results (continue on reverse side, if necessary)

Atrazine used as pre emergent on 475 acres of permittee farmed corn. Control was excellant.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 2

Reporting Year: 1965

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5/11,12, 16,17 & 6/14	Foxtail & other weeds in corn	A-3, 5 & 6	93	Atrazine	200 lbs.	2 lbs/A.	Water 20 gal/A	Ground spray

10. Summary of results (continue on reverse side, if necessary)

Atrazine was used on 93 acres of refuge farmed corn. Control was excellant when used as pre emergent. 80% effective as post emergent in A-3 and A-6-2.

35500

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 3

Reporting Year: 1965

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5/1-7/15	Weeds in Soybeans	A-4,7,8,10,13,14,15	116	Amiben	285 lbs.	2½ lbs/A.	Water 10 gal/A.	Ground Spray

10. Summary of results (continue on reverse side, if necessary)

Control was excellent for foxtail and good on other weeds.

35500

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge	
Squaw Creek	
Proposal Number	Reporting Year
5	1965

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5/22	Shatter cane, Foxtail, etc. in Soybeans	North Portion of A-14	12	Trefluralin	18 lbs.	1½ lbs/A.	Water 10 gal/A.	Ground spray

10. Summary of results (continue on reverse side, if necessary)

Did not control shattercane and did a mediocur control job on other weeds.

3550

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 6

Reporting Year: 1965

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6/1-9/15	Willow - Salix interior, nigra & amygdaloides and Cottonwood - populus deltoides	A-7 Ditch, Davis & Squaw Creeks and Squaw Creek spillway ditch levees.	50	2-4,D & 2-4-5,T	25 lbs each	½ lb/A.	Water 10 gal/A	Ground spray

10. Summary of results (continue on reverse side, if necessary)

Retarded sapling growth making complete control by burning and mowing possible.

35500

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 7

Reporting Year: 1965

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6/1-7/30	Sunflower, cocklebur, Morning glory and other broad leaf weeds in corn	A-1,7 & 14	126	2-4,D	126 lbs.	1 lb/A	Water 10 gal/A.	Ground spray

10. Summary of results (continue on reverse side, if necessary)

Killed existing crop of broadleaf weeds to encourage foxtail grass as well as corn growth.

35500

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 8

Reporting Year: 1965

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
8/2-9	Disease carrying mosquitoes	Northwest Pool, Northeast Pool & Bluff Pool	2,000	Malathion	200 lbs.	0.1 lb/A.	none	Airplane

10. Summary of results (continue on reverse side, if necessary)

No effect on insects nor wildlife noted. Apparently the application was too weak. The aerial service was recalled to treat Mound City and Craig when expected relief from mosquitoes did not occur.

35500

Burgess 442-3570

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service Regional Information

BUREAU OF SPORT FISHERIES AND WILDLIFE

Squaw Creek National Wildlife Refuge
Mound City, Missouri 64470
November 30, 1965

"SQUAW CREEK DIGEST"
By: Harold H. Burgess
Refuge Manager

Local duck club owners and lessees' can do a lot toward sending more brood ducks north to increase the 1966 duck population.

By draining their shooting ponds at the end of the duck hunting season they can keep waterfowl from getting poisoned by consumming spent lead for grit or food. Frank Bellrose in Waterfowl Tomorrow states "The average hunter fires 5 shots for every duck he bags. A 12-gauge shell contains about 280 pellets of number 6 shot. Accordingly up to 1400 pellets may be deposited on waterfowl hunting grounds for every duck killed."

One shot eroding in a duck's gizzard may be fatal. When lead is eroded from the shot, soluble lead salts pass into the digestive tract and paralyze the gizzard so that the duck often starves to death - even where there is abundant food.

Several thousand lead-poisoned ducks die annually on and near Squaw Creek National Wildlife Refuge. Since hunting is not permitted on Squaw Creek Refuge and silt has long since covered any spent shot that existed on the area when it became a refuge, we assume that the ducks are getting the lead from our neighbor's ponds. We therefore ask, please turn off your pumps and drain your ponds when the duck season ends.

A wild flamingo strayed to Squaw Creek Refuge in 1965.

Photograph by the St.Joseph Museum

Flamingo Squaw Creek May 1965

Juvenile eagle, apparent victim of malnutrition due to inexperience in capturing own food Lou Swenson photo

Waterfowl are not attracted to the refuge's centrally located "cordgrass prairie"